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Compounding Latex

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THE numerous patents granted in recent years for the application of rubber latex in many diversified fields clearly indicate that a distinct technology is being developed in the rubber industry with respect to manufacturing products direct from latex. The use of new materials always brings with it new problems. This condition has been especially true of rubber latex on account of its peculiar properties as a complex dispersion of low stability.

Hancock pointed out many of the desirable uses for latex nearly a hundred years ago, but it was only within recent years that latex was definitely accepted by the rubber industry as a supplementary raw material.[1] This acceptance is largely due to lower costs and new uses for latex found by systematic research. The recent introduction of concentrated latex, having a consistency of very thick cream, has also helped to reduce transportation costs as well as to insure a more uniform product.

The wet compounding of latex presents problems which have no analogy in the conventional methods of working dry rubber. Thus one writer has said:

"In the compounding of latex it is well to forget most of what is known of rubber compounding either with breaking down machinery or rubber benzol.[2]

The efficient technical control and saving in costs effected by the use of latex has attracted many rubber technologists by the possibilities latex offers. Thus was recently stated[3] that the "Study of latex and dispersions promises a new era resulting in improvement of quality in many rubber products and marked increased economy by reduction of power required, the elimination of the fire risk of flammable solvents as well as solvent loss by evaporation."

Latex compounding presents many new problems to the rubber technologist, requiring a thorough knowledge of colloid chemistry. For example, the addition of finely divided fillers may cause coagulation of the latex owing to an electrical charge carried by the added material which neutralizes the normal negative charge on the latex particle. Some fillers such as carbon or zinc oxide absorb water in the latex and thus cause coagulation. Substances to be added to the latex are thus often ground in a colloidal mill to disperse the particles in water. The latex itself has a tendency to deteriorate when in contact with the air and stabilizers are therefore often added. Rubber cements from latex are, for instance, prepared in the colloid mill; stabilizers, fillers, and adhesives are processed together at one time.

Practical methods of compounding latex have been already described to some extent.[4] In the present article methods of compounding ingredients to latex and formulas for preparing latex for specific purposes will be given as described in United States patents which have been issued up to March, 1932. Most of these patents have been issued within the last few years and they describe latex compounding not yet found in the usual literature.[5]

Abstracts of Patents

1. Defaucamberge, 943,658, Dec. 21, 1909. Latex and viscose are mixed together in any desired proportions. The resulting product is coagulated in a bath of sulphate of ammonia and then washed and vulcanized.

2. Davidson, 1,145,351, July 6, 1915. Sulphur is compounded with latex by adding to the latex an aqueous solution of 5% of sodium thiosulphate relative to the latex, or about 3% of polysulphide of potash, or about 4% of a mixture of these in equal parts. This mixture is coagulated by acetic or hydrochloric acid and it is then washed in water containing sodium carbonate. Phenol or creosote may also be added to preserve the rubber.

[1] Last year, for example, 4,000 tons dry weight of raw rubber in the form of latex were imported into this country.

[2] "Addition of Compounding Ingredients to Rubber Latex." INDIA RUBBER WORLD, Sept., 1923, p. 763.

[3] "Review of Recent Patents," *Ibid.*, Feb., 1932, p. 66.

[4] "Liquid Rubber Compounding," Webster Norris, *Ibid.*, Feb., 1931, pp. 53-55, 64; "Addition of Compounding Ingredients to Rubber Latex," *Ibid.*, Sept., 1923, pp. 763-65.

[5] Abstracts of German and British patents will be found in "Latex," E. A. Hauser, 1930, pp. 161-91. This list is not entirely complete. For United States patents describing the direct uses of latex see "Uses of Rubber Latex" (126 patents), Joseph Rossman, INDIA RUBBER WORLD, Oct., 1929, pp. 63-66; Nov., 1929, pp. 67-68; Mar., 1930, pp. 65-66; Apr., 1930, pp. 69-70. Also see "Rubber Latex," *Ibid.*, Dec., 1930, pp. 57-58. Patents describing the compounding of latex with paper pulp are given in the article "Latex Sizing by the Beater Method," Joseph Rossman, *Paper Trade J.*, May 31, 1928, pp. 45-46.

3. Schidrowitz and Goldsbrough, 1,156,184, Oct. 12, 1915. Spongy rubber is made by coagulating latex under conditions producing a porous coagulum and vulcanizing. The following examples are given: (1.) Equal quantities by volume of latex and of a saturated solution of ammonium carbonate mixed together are heated in a water bath and 1% by weight of finely divided sulphur stirred in. Coagulation may be induced by adding enough acetic acid while stirring the mixture, and the containing vessel is then placed in a steam vulcanizer and cured for about one hour at 260° F.; the quantity of acid and curing time and temperatures are varied according to the latex employed and to the nature of the sponge desired. (2.) To 100 cc. of latex 4 g. of finely ground ammonium carbonate are added; then 100 cc. of an 8% solution of sulphur in carbon bisulphide (100 cc. containing 8 g.) are stirred in until a fairly firm coagulum is obtained, which is vulcanized for, say, half an hour to one hour in steam. (3.) To 100 cc. of latex, 100 g. of powdered ammonium carbonate are added and then 40 cc. of carbon bisulphide containing in solution 2 g. of sulphur until a coagulum is obtained, which is vulcanized under water for about 30 minutes. (4.) To 100 cc. of latex, containing about 33% of solids are added 5 cc. of a solution of sodium polysulphide prepared by passing sulphureted hydrogen into caustic soda solution and adding sulphur, such polysulphide containing about 33% of precipitable sulphur. To 100 cc. of latex so treated are added 25 cc. of 5% acetic acid, and the mixture is stirred until creaming or incipient coalescing or coagulation takes place, after which action 100 cc. of a 1% acetic acid solution are added and the mixture stirred until a homogeneous cream, not coagulum, is obtained. This is then warmed on a water bath until the sponge formation is satisfactory. The containing vessel is placed in a steam vulcanizer and cured for 30 to 60 minutes, according to the condition of the latex and the character of the sponge desired. (5.) To 100 cc. of latex to which sodium polysulphide has been added as in Example 4, 5% acetic acid is gradually added with continual stirring until creaming sets in. This action takes about 20 cc. of acetic acid. Then 5 g. of powdered barium carbonate are well stirred in; the mixture is then diluted with 50 cc. of water and stirred again, during which operation a sufficiency of 5% acetic acid is added to cause coagulation and effervescence. This stage requires about 50 cc. of acetic acid. The container is then placed in a vulcanizer and the contents cured for about 30 minutes at 286° F. (6.) As in Example 5, but instead of 5 g. of barium carbonate there is used a mixture of 5 g. of barium carbonate, plus 5 g. of magnesium carbonate, plus 3 g. of ammonium carbonate. (7.) To 100 cc. of latex sufficient 5% acetic acid is added to induce creaming (about 20 cc.). After this action are stirred in 3 g. of finely divided sulphur and a mixture of barium, ammonium, and magnesium carbonate as in Example 6; about 50 cc. of 5% acetic acid are then added and vulcanized as before. (8.) To 100 cc. of latex sufficient 5% acetic acid is added to induce creaming. Next it is diluted with 50 cc. of water. Three g. of finely divided sulphur are then stirred in and finally enough 5% acetic acid is added to produce a stiffening, but not complete coagulation—for which purpose 20 to 50 cc. of the acid are necessary. The mixture is vulcanized as before, with or without previous heating on the water bath. (9.) To 100 cc. of latex are stirred in 10 g. of precipitated chalk, 6 g. of sulphur, and 20 g. of powdered salicylic acid, 100 cc. of water are added, and the mixture is stirred thoroughly and vulcanized as before. (10.) To 100 cc. of latex containing 1 to 3% of ammonia are added 10 cc. of an alkaline sulphide solution containing 30% precipitable sulphur (or an equivalent of ordinary sulphur in suspension) and 2 g. of powdered ammonius carbonate. Then are added 20 to 40 cc. glacial acetic acid according to the alkalinity of the latex and character of the sponge desired, diluted with 20 cc. to 120 cc. of water; the mixture is stirred, and the containing vessel is placed in the vulcanizer.

4. Schermerhorn, 1,204,697, Nov. 14, 1916. A protective coating composition consists of latex 20%, benzene 15%, ether 25%, rye flour 20%, and plumbago 20%. The composition is especially desirable for use as a combined filler and intermediate body coating on vehicles. A single coat of the composition, which can be applied, dried, and rubbed down within half a day, will take the place of the usual fillers, and also of 2, 3, or more coats of rough-stuff, which, as ordinarily employed, must each be dried and rubbed down before the application of another coat.

5. Slocum, 1,293,957, Feb. 11, 1919. An adhesive is prepared by dissolving one part of thickened castor oil in 2 parts of gasolene and stirring this mixture into 5 to 6 parts of uncoagulated latex. Prior to or subsequent to coagulation or at any time prior to vulcanization sulphur or other vulcanizing agent may be added to the mass. The resulting product after coagulation, etc., is a highly adhesive form of rubber.

6. Slocum, 1,332,926, Mar. 9, 1920. Latex is treated with 0.2% of sodium fluorid based on the weight of the latex. After 5 to 8 hours the latex becomes coalesced, whereby its viscosity is increased and a medium produced in which various materials such as oils, fibers, etc., may be uniformly suspended. To the coalesced latex are added pulped Hevea seeds which have previously been hulled and ground to an emulsion. The quantity of pulped seed employed will vary in accordance with the desired characteristics of the resultant product. For a somewhat soft rubber suitable for tube stock and the like a small proportion of the seed based on the coalesced latex will be used. For a sticky rubber suitable for rubber tape and the like a relatively larger percentage will be employed. Sulphur or another vulcanizing agent may be added, along with the pulp, or the addition may be made prior to that of the pulp, or at any time before vulcanization. The rubber may then be vulcanized.

7. Biddle, 1,437,487, Dec. 5, 1922. Casein is compounded with latex and other ingredients in the following proportions by weight: 30 parts of rubber, 5 parts of sulphur, 40 parts of zinc oxide, 5 parts of lampblack, 5 parts of litharge, 5 parts of antimony sulphide, and 10 parts of casein. The composition is used in manufacturing tires, mats, linoleum substitutes, flooring, pool, billiard, bowling, and tennis balls, belting, shoe compositions, pavements, insulating materials, household and personal articles, chemical apparatus and equipment buttons, flexible adhesive and coating, and waterproofing compositions. The value of using casein in compositions of rubber lies in its insolubility under certain conditions and in its flexibilty when combined with non-evaporating substances like oils and tars.

8. Schidrowitz, 1,443,149, Jan. 23, 1923. The process consists in vulcanizing latex under such conditions as to prevent coagulation. The following examples are given: (1.) 1.6 cc. of ammonia (0.88 sp. gr.) are added to 100 cc. of latex (containing about 30% of rubber), and then a thin cream consisting of 3 g. of sulphur, 1 g. of zinc oxide, and 1 cc. of piperidine in 35 cc. of water (the latter just made alkaline with 1 to 2 drops of ammonia) is stirred into the latex. The whole is placed in a vulcanizer and vulcanized, half-an-hour rise to 40 pounds and half-an-hour at 40 pounds. After vulcanizing, the liquid is strained through cloth or in some other convenient manner. The rubber may be separated from the strained solution either by evaporation or by coagulation (followed by washing and drying by any desired method). (2.) As Example 1, but using 1 g. of aldehyde-ammonia in lieu of the piperidine. (3.) As Example 1, but using instead of piperidine 10 cc. of a solution of

polysulphide of soda (containing about 25% of precipitable sulphur). (4.) To 100 cc. of latex (containing about 30% of rubber) are added (a) 8 cc. of a solution of sodium polysulphide (containing about 25% precipitable sulphur) and (b) 50 cc. of water made slightly alkaline with a few drops of ammonia. The mixture is heated in a vulcanizer for 30 minutes' rise to 286° F. and 20 minutes at 286° F. After vulcanizing, the liquid is strained, if requisite.

Coagulation of the vulcanized product may be effected by adding an acid such as acetic or sulphuric acid. For instance, to the liquid obtained according to Example 4 above, 50 to 70 cc. of a 5% solution of acetic acid are added, and the mixture is left to stand for some hours until substantially complete coagulation has been effected. The coagulum is then separated, washed, and dried in the usual way. Alternatively, in lieu of the acetic acid, 30 to 50 cc. of a 5% sulphuric acid solution may be added, and after completion of the coagulation the coagulum separated and also treated in the desired way.

9. Hopkinson, 1,491,265, Apr. 22, 1924. This patent describes a method of preparing a chlorinated latex composition which may be formed into cups, bars, disks, or any other shaped article desired. Slabs suitable for flooring may be made by running the material through a machine for rapidly stamping out small tablets. Material so formed is hard and not affected by water, oils, or gasoline. It is of fine grain, and the surface, when rubbed with emery cloth or suitable polishing material, rapidly acquires a brilliant luster. 100 parts by weight of kieselguhr is wet with 150 parts by weight of water to which have been added 9 parts by weight of concentrated ammonia, which acts as an anti-coagulant of the latex. The mixture is agitated in a mixer, and all parts of the kieselguhr are thoroughly moistened. 100 parts by weight of latex containing approximately 36% solids are then added, and the mass agitated until homogeneously mixed or until the mass is smooth or free from any granular structure. As so prepared, the mass may be stored indefinitely without coagulation of the latex.

For the preparation of a material for use as a floor material, the following procedure is carried out: A quantity of the latex and filler mixture prepared as above, the excess water having been removed, is screened or otherwise treated to cause it to assume a fine granular form and dried at 200° F. When dry, the material is placed into a suitable container and subjected to chlorine gas until the weight has increased to 20 to 24% based on the original weight employed or until no more chlorine will be absorbed. The end of the reaction is indicated when greenish fumes persist about the material after standing for some time. At this time the vessel is opened and allowed to aerate thoroughly. Next concentrated ammonia is stirred into the powder to neutralize the last traces of acid. The material is washed to remove any ammonium chloride formed. It is then dried and ready for molding or pressing. If a mottled effect is desired a dry pigment such as ultramarine blue, chrome green, iron oxide, raw sienna, or any other pigment may be mixed with the powder. For ceramic-like slabs the powder is placed in a suitable mold or frame and pressed in a hydraulic press for 10 minutes at 225 to 240° F.

A product similar in appearance to hard rubber may be prepared as follows:

	Parts by Weight
Dry powdered completely chlorinated latex-filler mixture (containing the ingredients described in the first procedure above)	90
Carbon black	15
Solvent (benzol, solvent naphtha, etc.)	36
Ground scrap or uncured rubber (pale crepe)	10

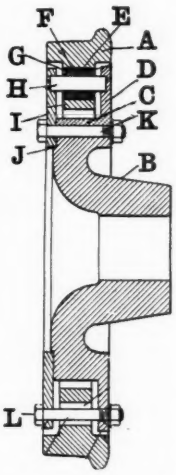
The latex-filler mixture, carbon black, and solvent are mixed in a mill until a uniform mixture is obtained at which time the ground scrap or other rubber is added. This has the effect of causing the mixture to crumble to a powder, and, when a homogeneous mixture is obtained, the material is ready for molding. This latter operation is carried out at a temperature of 200 to 240° F. The material is characterized by the rapidity with which it can be molded; a few minutes is ordinarily sufficient. This material closely resembles hard rubber, taking a high polish and being adapted for use in electrical apparatus, etc.

10. Gardner, 1,492,027, Apr. 29, 1924. A coating composition is prepared as follows: 100 parts of china clay and 100 parts of lithopone or titanium oxide are mixed together and moistened with a small amount of a 10% solution of ammonia or a 5% solution of caustic soda. The mixture of pigments is then ground together with latex containing one part of ammonia or one part of a 5% solution of caustic soda to 10 parts of the rubber latex. The pigment and the latex are combined in suitable proportions to produce a product of the desired fluidity, for instance, to produce a paint adapted to be applied by means of a brush. A small amount of a drying oil, such as linseed or china wood oil, may be added to the alkaline latex and pigment composition.

Another method of preparing paint consists in adding a small amount of alkali to a paint composition containing lithopone, china wood oil, rosin and mineral spirits and mixing the resulting paint composition with about an equal quantity of rubber latex. A smooth coating composition is obtained. The addition of sodium benzoate in amount of about 1/10 of 1% of the weight of latex employed prevents fermentation.

(*To be continued.*)

Rubber Cushioned Wheel



Railway Coach Wheel

A DEPARTURE in the improvement of steel wheels for railway coaches is noted in a recent invention[1] in which rubber is used to produce cushioning and sound deadening effect. The construction employed is indicated in the illustration. The wheel is in 2 main separate parts: the tread *A* and the center or hub *B*. The latter has a radial or cross flange *C* from one end of which extends a radial flange *D*. The tread has an internal flange provided with a series of openings *E* extending around the wheel. Rubber joints are arranged in these openings. These joints comprise an outer shell *F*, which is pressed into the opening *E*, a rubber insert *G*, and a central pin *H*. The rubber insert *G* is locked on the pin *H* and the shell *F* by surface bonding. An annular plate *I* rests on a shoulder *J* and is clamped at each joint against the flange *C* by bolts *K*, which extend through from side to side of the wheel and hold together the hub and the tread portions. Alternating with the rubber cushioned connections between tread and hub section are plain bolted connections as at *L*.

Where the rubber is vulcanized directly to the pin and the shell, it is placed under a very decided initial tension upon cooling and under this condition more thoroughly deadens the sound than if under compression. Enough joints are provided ordinarily so that the normal loads are carried on the tension side of these joints, and normally there is no rubber under actual compression. Under all normal conditions the entire load and thrusts of the wheel are communicated from one portion of the wheel to the other through the rubber.

[1] U. S. Patent No. 1,839,237, Jan. 5, 1932.

Dealers' Stocks of Rubber Footwear, March 1, 1932

THE Bureau of Foreign and Domestic Commerce announces[1] that as a result of the survey of dealers' stocks of waterproof rubber footwear as of March 1, 1932, made by the Rubber Division, 17,306 dealers reported 5,036,574 pairs on hand, an average of 291.0 pairs per dealer, against 20,400 dealers with 6,109,033 pairs, or 299.5 pairs per dealer, on March 1, 1931. The number of dealers reporting stocks of each class of rubber footwear, the number of pairs reported, and the average pairs per dealer, for the United States as a whole, is shown below for March 1, 1931, and March 1, 1932:

TABLE I. SUMMARY OF DEALERS' STOCKS

	March 1, 1931			March 1, 1932		
	Number of Dealers	Number of Pairs	Pairs per Dealer	Number of Dealers	Number of Pairs	Pairs per Dealer
Rubber boots	15,494	535,141	34.5	12,753	396,091	31.1
Lumbermans and pacs	8,091	253,785	31.4	6,526	168,266	25.8
Heavy arctics and gaiters	12,886	585,444	45.4	10,575	420,766	39.8
Light arctics and gaiters	11,916	608,470	51.1	9,750	513,465	52.7
Style gaiters, cloth	10,562	611,884	42.1	7,985	435,829	54.6
Style gaiters, rubber	9,868	660,368	66.9	8,179	634,861	77.6
Light and heavy rubbers	17,590	2,853,941	162.2	14,883	2,342,308	157.4
Total	20,400	6,109,033	299.5	17,306	*5,036,574	291.0

*This total includes 124,988 pairs of waterproof rubber footwear which were not reported by class.

Taking the total number of dealers reporting stocks as 100%, the percentage of dealers who reported stocks of each class of footwear is shown in Table II for March 1, 1931, and March 1, 1932. A study of the percentages shows that the proportion of dealers in each group was roughly comparable for the 2 dates although the percentage of dealers reporting stocks under each heading was noticeably lower than in 1931. Likewise, taking the total pairs of all kinds of footwear reported as 100% and calculating the percentage of the total made up of each class, the results in Table II indicate also that the 2 surveys are roughly comparable. The 1932 stocks contained a higher percentage of light weight and a reduced percentage of heavy weight footwear; style gaiters (rubber) appear to have increased in percentage of the total at the expense of style gaiters (cloth).

TABLE II. COMPARABILITY OF 1931 AND 1932 SURVEYS

	Percentage of Dealers Reporting Each Class		Percentage of Total Stock Reported for Each Class	
	1931	1932	1931	1932
Rubber boots	76.0	73.7	8.8	8.1
Lumbermans and pacs	39.7	37.7	4.2	3.4
Heavy arctics and gaiters	63.2	61.1	9.6	8.6
Light arctics and gaiters	58.4	56.3	9.9	10.5
Style gaiters, cloth	51.7	46.2	10.0	8.9
Style gaiters, rubber	48.4	47.3	10.8	12.9
Light and heavy rubbers	86.2	86.0	46.7	47.6
Total	100.0	100.0	100.0	100.0

The varying market demand for rubber footwear in different parts of the United States is indicated by the uniformity of percentages of dealers reporting stocks of each class of footwear for each region, in Table III, in the surveys of 1931 and 1932.

[1] Special Circular No. 3,244, Rubber Division, Department of Commerce, Washington, D. C.

TABLE III. PERCENTAGE OF DEALERS REPORTING EACH CLASS OF FOOTWEAR, BY REGIONS

MARCH 1, 1932

Regions	Rubber Boots	Lumbermans & Pacs	Arctics and Gaiters: Heavy	Arctics and Gaiters: Light	Style Gaiters: Cloth	Style Gaiters: Rubber	Rubbers
	%	%	%	%	%	%	%
New England	72.6	63.0	63.7	68.9	52.6	53.3	94.3
Mid. Atlantic	75.8	55.2	73.2	70.0	55.0	53.7	90.5
E. No. Central	76.9	48.9	79.3	71.3	57.6	60.1	91.3
W. No. Central	70.0	29.7	81.8	76.7	59.6	56.7	90.4
So. Atlantic	67.4	24.1	43.4	35.1	32.1	32.4	87.0
E. So. Central	70.9	15.8	37.4	30.9	27.2	30.8	73.7
W. So. Central	83.4	8.3	29.4	28.7	21.2	26.1	61.5
Mountain	70.9	41.6	69.8	60.7	45.4	44.8	82.4
Pacific	74.4	34.2	18.9	17.0	29.8	35.9	82.2
Total U. S.	73.7	37.7	61.1	56.3	46.1	47.3	86.0

MARCH 1, 1931

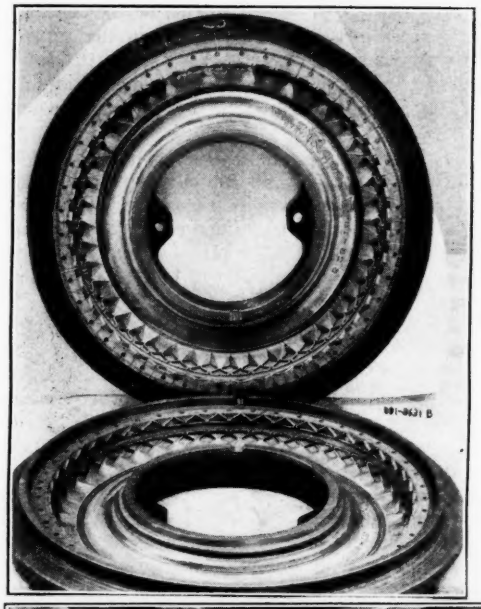
Regions	Rubber Boots	Lumbermans & Pacs	Arctics and Gaiters: Heavy	Arctics and Gaiters: Light	Style Gaiters: Cloth	Style Gaiters: Rubber	Rubbers
	%	%	%	%	%	%	%
New England	75.3	63.2	66.8	69.3	56.5	48.8	93.6
Mid. Atlantic	78.1	58.9	72.5	70.0	58.2	53.2	90.6
E. No. Central	81.1	52.7	81.6	73.7	64.1	60.4	92.4
W. No. Central	72.2	32.7	83.4	77.3	63.8	59.0	89.1
So. Atlantic	68.1	25.4	43.8	35.7	34.0	32.9	86.1
E. So. Central	73.3	18.9	37.5	31.0	32.3	30.8	75.4
W. So. Central	87.4	9.6	28.4	36.3	30.9	32.8	60.9
Mountain	65.6	42.2	73.6	60.4	53.8	45.3	82.4
Pacific	74.9	22.8	22.1	17.8	38.3	39.5	84.9
Total U. S.	76.0	39.7	63.2	58.4	46.9	48.4	82.2

In order to show the percentage of dealers holding stocks of various volumes, special tabulations were made of dealers' stocks of rubbers and total rubber footwear. In the current survey a larger percentage of dealers reported less than 100 pairs of rubbers and also of total rubber footwear than in 1931, with a smaller proportion of the dealers in the groups carrying larger stocks. The percentage of total dealers' stocks of over 999 pairs of rubbers, increased this year.

The stocks of waterproof rubber footwear held by dealers in the United States were appreciably lower March 1, 1932, than a year previous. That a smaller percentage of dealers reported stocks under each heading, and that average pairs per dealer were reduced for each class of footwear are facts representative of the trend, but there are also some evidences of a high mortality among small retailers, which indicate a likelihood that the total number of active retailers has been reduced as compared with a year ago.

It is not possible for the Rubber Division to state the total number of dealers holding stocks of rubber footwear, but it is our opinion that the stocks reported in the surveys for 1931 and 1932 represent no less than 33% of the total stocks held by dealers in each case, and the percentage probably is considerably higher.

Some of the reasons on which this opinion is based are that large distributers, holding over 999 pairs of rubber footwear on March 1, 1932, reported 37.1% of all the stocks reported in the current survey, and that the percentage of large distributers' total stocks reported is known to be much larger than the percentage of small retailers' total stocks. Furthermore comparing reported stocks with the total business indicated by Census Bureau reports of footwear production, renders untenable a belief that the amounts reported by dealers can represent less than the percentage estimated above.



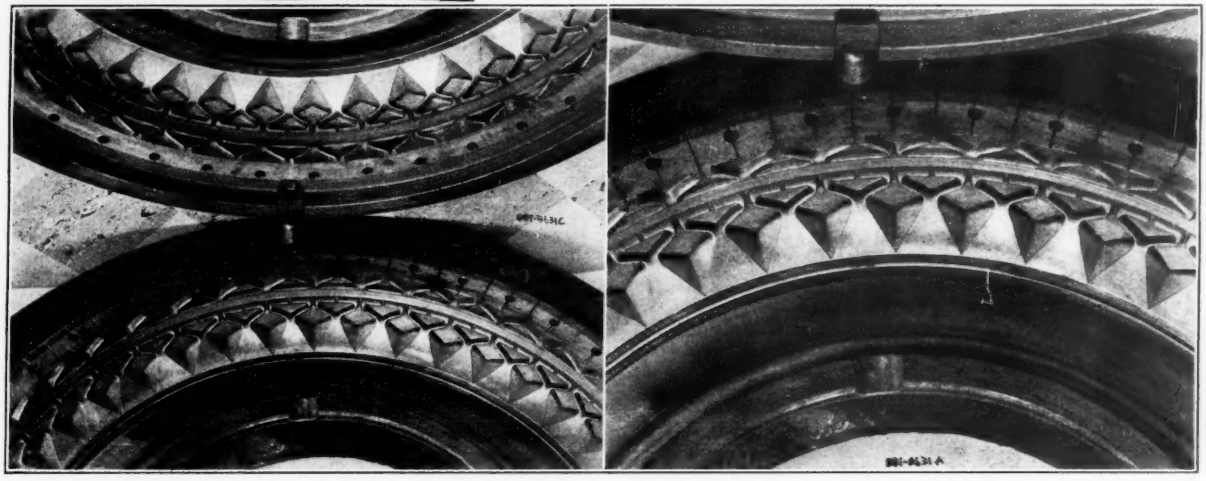
Aluminum

In the Rubber Industry

Ray A. Keenan[1]

Aluminum in its various forms and alloys finds a rather wide use in the production and the processing of rubber, not only because the metal is immune to attack by sulphur, sulphur compounds, and rubber solvents, but also because of its light weight and the fact that rubber does not adhere to it. Besides certain brilliancies and desirable surfaces can be obtained by its use.

One of the most striking properties of aluminum is its low specific gravity, 2.70. In the rubber industry this characteristic makes it particularly adaptable for movable equipment, such as molds, where ease of handling reduces costs; it also affects the original cost of equipment. Most of the common metals used in the construction of molds, conveyers, etc., are from 2½ to 3¼ times as heavy as aluminum. The saving in weight by the use of aluminum reduces the fatigue of the operator, increases production, and cuts down the cost of the supporting structures.



Complete Tire Mold Assembly Showing the Application of Aluminum Die Cast Inserts

THE ideal metal, did it exist, from the point of view of the rubber industry would probably be one which has the cheapness, strength, and hardness of iron and steel without their tendency to rust; the chemical inertness of glass without its brittleness; the heat conductivity of copper without its chemical action on rubber; and the ductility of tin without its weight and high cost. It would have a low specific gravity since lightweight equipment reduces handling costs. The metal used for molds or forms would be one to which rubber would not adhere and one which could be cleaned easily and could take a high polish. It would possess ready workability and could be easily cast or wrought into desired forms.

The ideal metal which would perfectly fulfill all of these requirements has never been produced. In aluminum, however, the rubber industry has available a metal which for many uses more closely approaches this ideal than does any other metal.

The light weight of the metal influences its use in many types of revolving or reciprocating parts.

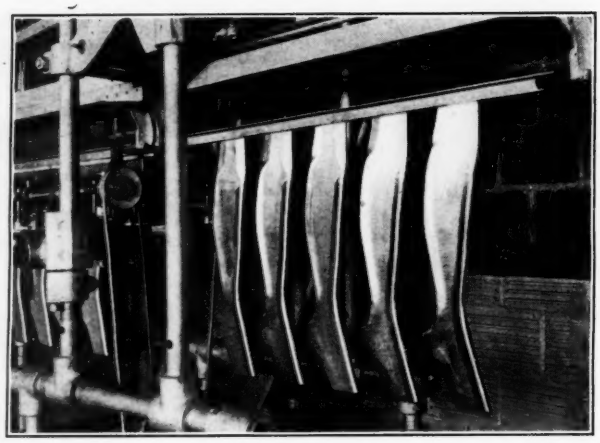
Aluminum is one of the best conductors of heat and permits better heat transfer than is obtainable with most common metals. It will conduct heat 5 times as well as iron does.

Possibly no other metal can be produced in so many different forms as aluminum. It can be obtained in plate, sheet, and foil, in bar, rod, and wire, in structural shapes and moldings, in tubing, in sand, permanent mold, and die castings, in forgings, in screw machine products, in rivets and nails, and in bronze powder. It can be riveted, torch, spot, and arc welded and is easy to fabricate into special and intricate forms of apparatus.

There are available strong and ductile wrought alloys which retain the desired characteristics of the pure metal but have the strength of structural steel. By making slight changes in cross-sectional area, strong alloy castings can be made to carry the same loads as malleable iron, cast iron, or brass. The alloys can be machined readily, about 3 times as fast as iron or steel.

[1]With Aluminum Co. of America, Akron, O.

In all the processes of rubber manufacture cleanliness is necessary. Particular pains are taken to avoid the possibility of contaminating the various products by foreign particles. For this reason it is almost common practice in the rubber industry to cover all table tops in the mixing rooms, the calendering shops, and making-up departments, with aluminum sheets. The surface of wooden cutting tables, if not covered in this way, becomes roughened, and small slivers fatal to fine work, such as rubber gloves, may get into the rubber. For the same reason aluminum is desirable for lining storage bins and any surface against which rubber, mixed or unmixed, cured or uncured, is to be placed.



Aluminum Die Cast Stocking Dipping Forms for Use with Liquid Latex

The fact that aluminum can be brass plated, and thereby rubber adhesion obtained, has developed some new potential applications for the metal in the fields in which it has heretofore been impossible to make use of its lightness, strength, and ease of fabrication. Good examples of this work are containers, small tanks, rubber coated metal parts for airplanes, etc.

The use of aluminum die castings as inserts in steel or cast iron mold blanks is finding considerable application as a means of reproducing intricate or ornamental engraving, such as tread inserts for tire molds. Mold inserts and forms made from die castings and employed in the manufacture of dipped goods will have smooth surfaces, extreme dimensional accuracy, faithful rendering of detail, and will reduce or totally eliminate the necessity of machining. This condition results in economies which are sometimes quite startling, particularly in the field of quantity production. It is often economical to use die cast inserts for producing molded goods where only a small number of cavities are required, as the cost of engraving the die, plus the cost of the die itself, may be but a small fraction of the cost of engraving each individual cavity.

The characteristics of aluminum make it particularly adaptable to the construction of molds for use in the production of mechanical goods, molded goods, and sponge rubber goods. Such molds may be easily machined and easily handled and impart a glossy finish to the rubber. Aluminum molds do not require cleaning so often and will conduct the heat faster than iron from the presses to the cavities in which are cured the various rubber articles. Aluminum molds are usually made from forged slabs, rolled plates, or castings. Sponge rubber molds are generally cast to size and used without machining the cavities although it may be necessary to machine the backs of the molds and the register.

Sand cast aluminum forms are widely used for making up and for curing all varieties of rubber goods, from boots to tires. Aluminum forms are largely employed in the manufacture of dipped goods, such as gloves, stocking forms, bathing caps, etc. The rubber is easily stripped off these forms.

Aluminum in the form of extruded shapes, sand castings, die castings, permanent mold castings, screw machine-products, and sheet is extensively employed for forms, dipping machine parts, frames, and racks, conveyers, tracks, curing troughs, tumblers, and other equipment used in the recently developed methods for making rubber articles from liquid latex. The ammonia in the latex exerts no corrosive influence on aluminum, nor does the warm atmosphere of the dipping and curing rooms, laden with moisture and chemicals, cause this light metal to rust or corrode and discolor or stain the rubber goods. Then, too, the high heat conductivity of aluminum proves a distinct asset.

Aluminum conduit lends itself exceptionally well to use in curing rooms and boiler rooms of a rubber manufacturing plant and other places in which a large amount of sulphur is present in the atmosphere. Since sulphur fumes and dampness have practically no effect upon aluminum, such installations of this metal will last for years.

Aluminum paint is used for its protection against moisture on steel and iron structures, its heat insulation effects on highly heated metal surfaces where the metallic film will decrease radiation losses, its lighting efficiency, and bright, clean appearance. It will not discolor in contact with sulphur containing gases.

Large quantities of aluminum rubber compound powder are used by manufacturers of solid truck tires. As a compound of the base stock, it increases adhesion between the metal band and the base. Another use for aluminum powder results from its high opacity to light; it is employed as a protective coating to preserve rubber from the deteriorating action of sunlight and air. Especially on sheets of rubber the protection rendered by the non-transparent aluminum film is both substantial and necessary.

Other applications of aluminum in the rubber industry include: the dies for producing serial numbers and brands on tires, heater tree connections, circular and straight inner tube mandrels, trays, cable for transmitting power, foil for curing hard rubber articles such as combs, foil for wrapping golf balls and rubber tape, bus bar, tire building drums, and tables, and machine parts. The trend in architecture toward the lighter colored metals has influenced the use of aluminum in the construction of service stations.

Some of the by-products of the aluminum industry also find application in the rubber industry. The finely divided inert powders, such as Alorco pigment and calcium aluminate, are desirable as rubber fillers; activated alumina may be employed to extract moisture from rubber solvents, to purify gases, etc.

Many of the features which make aluminum desirable in producing and processing rubber apply with equal force to the prior stages of production on the rubber estate. Aluminum has found many applications in the collection, transportation, and final coagulation of latex, such as collecting cups and pails, large tanks for transporting latex in bulk to the factories, coagulating pans and tanks, and corrugated roofing.

Roofing Material

A new composition suitable for roofing, floor coverings, paving blocks, insulation bricks, and various other construction purposes consists of shredded guayule shrub mixed with a waterproof binder. Proportions of ingredients cited as an example are 75% of blown bituminous material of a ductile nature and 25% of shredded guayule shrub containing 15% of rubber. Other mixtures may be made in which the binder is not preponderant, such as binder 40% and other ingredients 60%.

United States Rubber Consumption Survey, 1931[1]

THE total consumption of rubber in the United States during 1931, as determined by the Rubber Division with the cooperation of manufacturers, reclaimers, dealers, and others who submitted reports of consumption or year-end stocks, was less than in any year since 1925, both for crude rubber and reclaimed rubber, and the percentage use of reclaimed rubber also was less than for any year since 1925.

UNITED STATES CRUDE AND RECLAIMED RUBBER CONSUMPTION

	Crude Rubber Long Tons	Reclaimed Rubber Long Tons	% of Reclaim to Crude
1925	388,000	137,000	35.3
1926	366,000	164,500	44.9
1927	373,000	189,500	50.8
1928	437,000	223,000	51.0
1929	467,400	217,000	46.4
1930	376,000	153,500	40.8
1931	350,000	123,000	35.1

CONSUMPTION OF CRUDE AND RECLAIMED RUBBER BY CERTAIN COMPANIES

(Long Tons)

	Companies Manufacturing Tires and Other Rubber Goods			Companies Specializing in Tires and Inner Tubes		
	Crude	Reclaim	%	Crude	Reclaim	%
1929	277,300	98,200	35.4	112,500	24,960	22.2
1930	244,400	79,900	32.7	82,200	18,280	22.2
1931	212,800	62,360	29.3	78,600	14,350	18.3

	Firms Making Principally Rubber Boots and Shoes			Makers of Rubberized Fabrics and Clothing		
	Crude	Reclaim	%	Crude	Reclaim	%
1929	4,174	1,630	39.1	4,240	7,410	174.8
1930	3,979	1,100	27.6	3,630	4,030	111.0
1931	3,460	634	18.3	4,400	3,130	71.1

	Manufacturers of Rubber Heels and Soles			Manufacturers of Electrical Rubber Goods		
	Crude	Reclaim	%	Crude	Reclaim	%
1929	5,290	9,910	187.3	6,760	12,890	190.7
1930	4,880	8,000	163.9	5,980	8,750	146.3
1931	7,380	7,870	106.6	5,270	4,540	86.1

	Manufacturers of Mechanical Rubber Goods			Druggists', Stationers', and Dental Supplies, Sponge Rubber		
	Crude	Reclaim	%	Crude	Reclaim	%
1929	11,340	32,200	284.0	3,738	245	6.6
1930	10,375	23,970	231.0	3,754	98	2.6
1931	10,110	18,060	178.6	3,736	80	2.1

Analysis of the table shows that the consumption of reclaim has declined more than that of crude in each section of the industry and that crude replaced reclaim sufficiently in the heel and sole section and in the proofed goods section to account for a net gain in the consumption of crude, by the companies included in these groups, in 1931 over the 2 preceding years.

Consumption of reclaim has been better maintained by tire manufacturers than by manufacturers of other lines. While a lower percentage of reclaim is used in making tires than in other lines except perhaps boots and shoes, the total amount of reclaim used by tire manufacturers who also make other products is greater than the total amount used by all other manufacturers. The percentage decline in the use of reclaim from 1929 to 1931 was greatest in the case of manufacturers of proofed goods, but from 1930 to 1931 it was greatest in the case of manufacturers of electrical rubber goods.

The decline in the use of reclaim since 1928 has had the effect of maintaining consumption of crude rubber at a fairly steady annual rate during 1929, 1930, and 1931, in products other than tires.

The following table is intended to represent closely the tonnage of rubber and reclaimed rubber actually consumed in the United States during 1931.

MANUFACTURERS' 1931 CONSUMPTION AND YEAR-END STOCKS

	Crude Rubber Consumption Long Tons	Reclaimed Consumption Long Tons	Crude Rubber Stocks Long Tons	Reclaimed Stocks Long Tons
Actually reported	342,552	118,872	209,897	9,877
Estimated, basis reports previous years	3,448	2,728	1,800	175
Allowance for unreported consumption	4,000	1,400	2,450	125
Totals	350,000	123,000	214,147	10,177

The stocks of reclaim held by rubber manufacturers and reclaimers at the end of 1930 were estimated by the Rubber Division at 22,000 long tons. The consumption during 1931 is estimated above at 123,000 tons. Exports from the United States during the year are officially reported as 6,976 tons. In addition to the stocks at the end of 1931 reported above for rubber manufacturers (10,177 tons), the amount reported by 11 firms engaged in reclaiming, including some manufacturers who also reclaim, was 11,037 tons, and it is estimated that an additional 500 tons was held by reclaimers who did not report, making total year-end stocks of reclaim 21,714 tons. The 1931 production may be calculated from the above at 129,690 long tons, which compares with 157,968 long tons during 1930. The 1931 production of reclaimed rubber, as reported in quarterly reports of the Rubber Manufacturers Association, Inc., was 124,658 long tons, or 96.1% complete, and in its monthly reports was given as 123,190 long tons (95.0% complete). Year-end stocks of reclaim were reported by the Association in its quarterly report as 15,904 long tons (73.2% complete), and in its monthly report as 15,405 long tons (70.9% complete).

The quantity of rubber reported on hand by 30 importers, dealers, commission agents, and brokers at the end of 1931 was 87,433 long tons, which compares with the actually reported total of 62,869 tons a year previous.

The quantity of rubber on hand in the United States at the end of 1930 was estimated by the Rubber Division as 201,000 tons, all but about 2,800 tons having been actually reported by manufacturers, importers, and dealers.

The officially reported gross imports during 1931 amounted to 501,788 tons, and the reexports to 25,595 tons, leaving net imports of 476,193 tons. Adding this to the 1930 year-end stock gives 677,193 tons for 1931. While there is no means of checking these import statistics, such a means did exist during 1927-1930, which showed less than one-tenth of 1% possible error. The gross import statistics compiled and reported separately by the R. M. A. agree substantially with those officially reported for 1931.

[1] Special Circular No. 3251, Rubber Division, Department of Commerce, Bureau of Foreign & Domestic Commerce, Washington, D. C.

The consumption of 350,000 tons estimated for 1931, if deducted from the available supply would leave a year-end stock of 327,193 long tons. The total reported and estimated for manufacturers and the stocks reported by dealers aggregate 301,580 long tons, leaving 25,613 tons unaccounted for.

In past surveys an allowance has been made for shrinkage of rubber between time of importation and time of consumption. This factor has been assumed to be 1% of the consumption. It seems likely that the shrinkage would increase with the length of time the rubber is held in storage; therefore an allowance of 5,193 tons is considered permissible for 1931; the corresponding figure for 1930 was 3,081 tons. This 1931 allowance would reduce the year-end calculated tonnage to 322,000 tons, of which 20,420 tons is unaccounted for.

The Rubber Division will use 322,000 long tons as a starting point in calculating month-end stocks for 1932. Consideration of the allowance for wastage, on the basis of past experience, appears to be necessary for the purpose of bringing calculated stocks into agreement with consumption and net imports, and for this reason the Rubber Division will consider the *monthly* crude rubber consumption statistics reported by the Rubber Manufacturers Association as 91.0% complete during 1932, for purposes of calculating month-end stocks in the United States as reported in tables that are published by the Bureau of Foreign and Domestic Commerce.

Research a Two-Fold Benefit

HOW research largely benefits buyers of rubberware, while being of marked advantage to manufacturers, is interestingly related by H. L. Trumbull, of the Goodrich Chemical Research Laboratories, Akron, O.[1] In several years spent in painstaking study of the perishing of rubber it was found that the trouble was due to oxidation which could be accelerated by heating rubber in the presence of oxygen. Nearly 10 years more were spent in developing accelerated tests to prove the effectiveness of antioxidants in a few days or weeks as compared with months or years. Although chemical studies designed to identify the products of oxidation and show the velocities of the reactions were baffling, systematic study of the constitution of retarders finally revealed a limited class of materials which enabled compounders to control the rate of oxidation without interfering with proper cure.

During this long and tedious interval many problems of the industry were urged as more important than the study of oxidation retarders, but it is doubtful if any of them have produced results as beneficial to the industry and to consumers of rubber goods as the fundamental study which has resulted in the discovery of non-accelerating antioxidants which have so retarded the deterioration of rubber goods as to have resulted in saving the buying public about $50,000,000 annually.

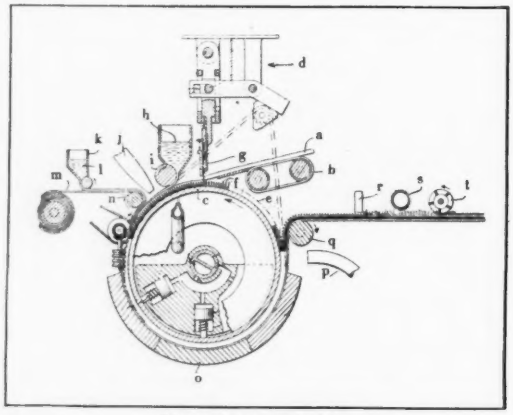
[1] *Ind. Eng. Chem.*, Feb., 1932, pp. 199-202.

Rubber Cemented Pile Carpet

A New Construction That Entirely Eliminates Spinning and Weaving

THE machine indicated in the accompanying illustration is that used in making and vulcanizing in continuous lengths the cemented pile carpet previously described in this journal.[1]

The various steps of the method and apparatus for making pile carpeting are outlined as follows with reference to the sectional diagram shown. The raw stock used for forming the pile consists of hair, wool, jute, or other fibers and is prepared by passing through a picker to separate the fibers and remove foreign material. The stock is then carded to form a batt of uniform thickness with its fibers generally arranged longitudinally of the batt. Thus formed the batt, *a*, is carried by means of an apron, *b*, to a chase, *c*, to be operated upon by a loop-forming mechanism, *d*.



Pile Fabric Machine

The machine consists primarily of a drum, *e*, somewhat wider than that of the pile fabric to be made. The drum is mounted in bearings and driven at a slow constant speed by a worm wheel attached to its circumference.

Mounted on the cylindrical surface of the drum are thin plates or so-called "wires," *f*, arranged parallel with the axis of the drum and spaced apart at equal intervals so as to provide the desired number of loops per inch in the final product.

As the batt is forced between the wires by action of the blades, *g*, the loops thus formed are held firmly in place by a set of presser feet. Immediately after formation of the loops, a solution of vulcanizable rubber cement, *h*, is applied to the exposed looped surface of the batt by roller, *i*, thus forming a continuous even coating on the fibers. Excess solvent is removed by a blast of air from nozzle *j*.

Rubber dispersion, *k*, is applied by roller, *l*, to one side of burlap, *m*. The latter is applied by roller, *n*, as backing to the cemented looped surface. Continued rotation of drum, *e*, brings the fabric construction into contact with a succession of vulcanizing plates, *o*.

The vulcanized fabric is cooled by air from nozzle, *p*, and stripped from the drum by roller, *q*. The carpet is finished by steaming applied on its looped surface at *r*, following which action the fibers are tigered by a brush, *s*, to remove loose fibers and finally trimmed to uniform length by a rotary cutter, *t*.

The carpet produced on this machine is said to combine low cost and durability in hard service.

[1] "Liquid Rubber and Carpets," Mar. 1, 1931, p. 56.

Footwear Features

Rubber and Canvas Sport Shoes

IN ALMOST every phase of athletic activity the feet assume a major role. The shoes worn in many instances may mean the difference between victory and defeat.

Cognizant of the demands, then, of a public keenly interested in sports, footwear manufacturers have evolved various types of sport shoes to suit every purpose. Thus on the market you will find canvas rubber soled shoes for general wear, indoors and out, for camping, gardening, picnicking, tennis, basketball, soccer, hockey, track, hunting, fishing, hiking, boating, yachting, the beach, the gymnasium, and even for work.

Converse Rubber Co.
All Star Basketball Shoe

One of the most important points, of course, is proper fit. Consequently manufacturers are producing shoes made over special orthopedic lasts, having arch stays and arch and heel cushions to give necessary correct support. Foot conforming shanks, moreover, insure snug fit through the arch. Loose linings and satisfactory insoles, many non-heating, also contribute to the cause; while narrow heels with special counter construction are another prime feature.

United States Rubber Co.
Trim-Arch Keds

Different types, not to mention innumerable styles, of such footwear are on the market. Do you prefer a bal, a plain shoe, an oxford, or a pump, the model is yours for the asking. Lace-to-toe numbers or blucher cuts are available. Pumps with ankle, cross, T, or wrap around straps likewise may be had. To keep them in place buttons or adjustable snap fasteners are used.

United States Rubber Co.
Diana Athletic Shoe

United States Rubber Co.
Kiddy Play Shoe

Hodgman Rubber Co.
All Rubber Waders

The size ranges of this footwear follow: men's 6 to 12; boys' 2½ to 6; youths' 11 to 2; little gents' 6 to 10½; women's 2½ to 8; misses' 11 to 2; and children's 5 to 10½.

The variety of colors offered forms a most attractive array to suit the most discriminating taste. The uppers, and sometimes the entire shoe, come in white, brown, suntan, khaki, and black. Occasionally a 2-tone print of the leading shades is available. The trimmings, however, often assume gayer hues. Combined with white duck uppers are found black with black, red, or orange foxing or with red stitching; brown with brown or brown and orange foxing; and blue. Suntan shoes are decorated with dark green; tan or tan with green or orange foxing; all brown; or all black. Brown footwear boasts black or gray trimming. A serviceable model is black touched with white or gray. A brown and white mottled top sports chocolate trimming.

Two-tone trims, as well as foxings, are very popular. Thus we find white or suntan ornamented with gray and black or black and brown. White with black and blue trim makes a very attractive number; so does suntan with tan and orange. A striking combination is gray with brown and white trimming. Some khaki and some white shoes have finishings of cream and dark brown.

The soles in many instances, though, do not always follow the general color scheme of the shoe. Thus appear amber, white, black, red, brown, and even 2-tone outsoles. Their motifs, too, vary considerably. Crepe soles, some with 2-color cut-out designs, are very popular. But molded non-skid soles also have many faithful adherents. Patterns include horseshoes, 4-leaf clovers, corrugations, diamonds, swastikas, circles, squares, and even vacuum cups.

Many of these rubber-soled shoes fill a variety of purposes in general use. Some, however, fashioned for a certain sport, require a particular construction. Basketball shoes, for instance. Made over special lasts, they are loose lined and shaped to avoid the ill effects of tight lacing. All rough seams inside the shoe are eliminated to protect against chafing; while sponge rubber arch and heel cushions relieve strain. Smooth toe linings and ankle guards are other salient features. Back stays and toes are suitably reenforced, and proper insoles are provided. Some shoes even have wide supporting stays. Soles are either of crepe of floor gripping quality or molded of unique design to complement the clever and speedy footwork of the player. One model, with a non-skid pivot pattern on the sole, has ventilating eyelets in the shank. Lace-to-toe styles are ever gaining in favor. Basketball shoes come in several colors to match or harmonize with the team's uniform.

For fishing an entirely different type of footwear is necessary. Boots of varying heights thus are offered. Waders, however, are frequently preferred. A popular model, all

Servus Rubber Co. **"Crepe-Tred" Tennis Oxford**

rubber, extends to the hips. It is of olive colored rubber friction coated to durable olive jeans fabric suitably reenforced. Sturdy boot feet have a foot shaped last for comfort; while built-in cleated soles prevent slipping. These waders also have handy inside pockets, drawstrings, and 6 suspender buttons. The outfit comes in various sizes to fit the build of any fisherman. Its weight averages 6 pounds.

Rubber soled work shoes are very serviceable. Of heavy brown duck, blucher cut, one model is made over a new type of last. Loose-lined, the shoe boasts a half bellows tongue, with a heavy corrugated sole, heel, gum foxing, and toe cap all of brown. A somewhat similar number, also of strong brown duck, blucher cut, has a heavy black sole and a molded heel of black compound. The toe cap, too, is black rubber. A solid steel shank braces the arch and prevents breaking down at this point.

Canvas rubber soled footwear for women, of course, presents a daintier appearance. The shoes, however, are as sturdily built and as efficiently designed for service as their masculine counterparts; for what sport nowadays, no matter how strenuous, fails to attract innumerable women participants.

Servus Rubber Co. **"Vida" Pump**

All white shoes predominate. But other colors, including check and mottled patterns, with contrasting trims are not lacking. Nor are such talking points as lace-to-toe cut, ankle guards, saddle straps, protected and reenforced toes, sponge cushion heel pads, nickel eyelets, non-heat insoles, and special arch supporting constructions and counters. Styles vary from bals to oxfords and pumps. Many moreover, have wedge or molded heels. On the pumps straps assume several positions such as angle, cross, or T. Buttons or adjustable fasteners are used on them. One pump even has a flat white bow on the vamp.

Oxfords of white coutil, some with low heels, have tan, black, or red saddle trim to harmonize with the majority of milady's sport costumes. Soles and heels are white rubber. Another number, blucher cut, has uppers of brown and white printed fabric and tan eyelet-stay trim. The knurled outsole and low heel also are tan.

A special feature found on some shoes both for men and women is ventilation. One all-white oxford, made particularly for tennis, has 3 slits on the vamp to keep the feet cool. Another white tie carries a vamp of special mesh material reenforced with duck underneath, at the edges, making a cool comfortable shoe for general wear in summer. It has an inside net toe cap.

Firestone Footwear Co. **Basket Weave Oxford**

Shoes for the very much younger set are designed to take care of the needs of growing feet, with much thought given to proper support and correct fit. The styles, though, are often patterned after those of adults. The growing boy, of course, is satisfied with the bals fashioned for rough and ready wear. But his daintier sisters and little brothers require both for general wear and play a less sturdy, but still serviceable oxford or pump. Colorful checks and 2-tones abound. Various styles of straps also vie for favor. A very attractive play slipper for misses and children has a white duck upper printed in gay juvenile design in 4 bright colors. The wrap-around strap is held in place with an adjustable snap fastener; while a white corrugated sole completes the dainty picture.

Other models, for men, women, and children, also clamor for detailed attention, but time and space do not permit of further description. Suffice to say that these canvas rubber soled shoes in their variety of styles, designs, and colors will fill every need of even the most fastidious wearer, be he or she athlete, housewife, harum-scarum boy, or tiny tot.

Patentable Inventions

In the Rubber Industry

THE following is a continuation of the interesting and useful data on patenting inventions for the rubber industry, from our April 1, 1932, issue.

Double Use

The use of an old process, apparatus, or composition of matter for a new and analogous use is not invention. An old process applied to an analogous or new subject matter with no change in the manner of application and accomplishing no new result is not patentable. For example, a refrigerating process which was used for preserving fish was held to be unpatentable, for a similar process was previously used for preserving corpses.

The Supreme Court has said: "If the new use be so nearly analogous to the former one, that the applicability of the device to its new use would occur to a person of ordinary mechanical skill, it is only a case of double use, but if the relations between them be remote, and especially if the use of the old device produce a new result, it *may* at least involve an exercise of the inventive faculty. Much, however, must still depend upon the nature of the changes required to adapt the device to its new use." (Potts v. Creager, 155 U. S. 597).

In other words, if the elements and purposes in one art are related and similar to those in another art to such extent as to make an appeal to the mind of a person having mechanical skill or knowledge in the second art, the 2 arts must be said to be "analogous."

Example of Double Use

Thus a process of cleaning rubber by reducing it to a plastic condition and forcing it under pressure through a strainer to remove foreign substances, covered by patent No. 642,814, was held to be void for lack of invention in view of prior patents for machines for forcing clay through a strainer. The court said:

"If it was old thus to clean other plastic substances, I do not see how it can be said that there was invention in using the same method to clean rubber or substances similar or analogous thereto. Nothing new in principle or function is involved, and no object or result which can properly be called new is attained." (Cowen v. Boston Woven Hose & Rubber Co., 214 Fed. Rep. 806).

It should be remembered, however, that the application of old and well-known devices to a different technical field, in which they perform a new function, may constitute invention when the advantages to be gained by their use for such purpose were not obvious.

It should also be noted that the substitution of equivalents whether in a machine, composition, or process is not invention. An equivalent may be defined as an "act or thing known by persons skilled in the art to be capable of performing the same function in substantially the same way."

Details of Process Must Be Given

In order to obtain a valid patent it is necessary that all the essential details be disclosed. Thus Patent No. 1,045,234 for a process of making rubber sponges was held invalid because the patent did not describe the blowing agent used. (Featheridge Rubber Co. v. Miller Rubber Co., 259 Fed. Rep. 565). The process consisted in incorporating a blowing agent in the rubber, curing, and then mechanically breaking down the walls of the cells by running the mass through a wringer. The sponge could only be made successfully by using "paragol," a corn oil substitute as the blowing agent which was used secretly by the plaintiff. However, when the defendant discovered what ingredient was necessary, suit was brought on the patent. The court refused to enforce the patent because as it said:

"We think there is no reasonable escape from the conclusion that the patentees' real discovery was not in what they disclosed in the specification, but in what they concealed, and that their purpose was to get the protection of a patent, and, at the same time, hold back the knowledge which would allow the public to manufacture successfully at the end of the patent term."

Where an invention involves mechanical operations, that is, a series of steps taken by a machine, and if it produces a new and useful result it is also patentable. To be patentable, however, the process must not merely define the operation of a particular machine. If the process is merely the operation of a machine then the inventor should claim the machine as his invention because that is his real invention. It is often very difficult to decide whether the invention resides in the machine or in the process. A simple rule is this: Find the novelty and you find the invention. If the process claims have to be limited to a particular apparatus, it is a confession that the process is old and that the invention lies in the apparatus. The process must be so independent of the apparatus that a person familiar with that particular class of work would think of more than one apparatus for carrying out the process.

Invention in a Composition of Matter

The definition of a composition of matter and what it may embrace has already been given. A compound which has never been known or produced before is clearly patentable. When 2 or more compounds are mixed or chemically combined, the product may or may not be patentable, depending upon the result obtained and the properties of the new product.

It may be broadly stated that the work of an average competent rubber chemist in overcoming difficulties or problems is usually not invention. The exercise of ordinary chemical skill and the use of well-known chemical expedients are regarded as not involving any invention. In order to obtain a patent the rubber chemist working in some specific field is expected to do more than what would be clearly inferrable from the store of accumulated literature or the accessible chemical knowledge and procedure. If the solution of some problem would occur to the average chemist or "a person skilled in the art" as he is called in legal phraseology, then no patentable novelty is present. The general rule in all cases is that the achievement of an average chemist exercising his chemical training and utilizing the known available facilities is not of such a high order of originality as to merit the designation of invention. The results of the exer-

cise of ordinary chemical skill, in other words, are not patentable. But if a chemist should perform something unusual in overcoming a difficulty which was not obvious to other chemists, then he is entitled to patent protection. He must *create* something new by his own mental processes. Invention has been defined to mean in the sense of patent law, "the finding out, contriving, or creating by the action of the intellect something not existing before or not known before."

In order to merit a patent the chemist must accomplish something more than can be *reasonably expected* of the average chemist working in the same field.

Surprising results may sometimes be obtained in combining 2 well-known substances; so it is often impossible to predict the result. For example, an alloy of 24% nickel and 76% iron has a higher coefficient of expansion than either metal alone, but if the nickel be increased to about 36% the resulting alloy, "Invar," has an almost negligible coefficient of expansion, being less than 1/12 that of either iron or nickel.

But where the compounding of 2 or more ingredients produces no new or unforeseen result, no invention is involved because any skilled chemist could do exactly the same thing when confronted with the specific problem. The rubber chemist must add something to the known chemical knowledge or technology; otherwise he does not deserve a patent. It follows that a simple substitution of materials or a good selection from known materials is usually not patentable, as the chemist merely utilizes the well-known chemical or physical properties of such materials.

Substitution of Material

Innumerable cases have therefore held that a mere substitution of one material for another does not constitute invention where there is no change produced otherwise, but invention may be present where the substitution brings to light a new property of the material or produces a new and useful result, or increases the usefulness or efficiency, or lowers the cost provided this superiority is not a difference in degree but in kind.

The substitution of one ingredient for another in a composition may or may not amount to invention, depending upon whether such substitution would be expected of a competent chemist to produce a desired result. If the final properties of the composition are the same after the substitution, then it can be assumed that it is not patentable without inquiring into the value of the reactions between the ingredients. If new properties and uses are developed, it is good evidence of invention.

It has also been held that if the change in material amounts to the difference between a partial and a complete success, it is patentable. But the use of an old material in an old way is not invention.

Selection of Suitable Chemicals May Be Patented

The selection of a single compound from a class of compounds for a specific use may sometimes amount to invention. Thus, although mono-phenyl and tri-phenyl derivatives of guanidine were known as accelerators of vulcanization of rubber, the Supreme Court regarded the discovery of diphenylguanidine as involving more than ordinary chemical skill, saying that "the catalytic action of an accelerator cannot be forecast by its chemical composition, for such action is not understood and is not known except by actual test." (Corona Cord Tire Co. v. Dovan Chemical Corp., 276 U. S. 358.)

A good selection from known materials does not involve any invention, but the selection of one substance from a large number as the active agent for a definite purpose, when it has not been known to be suitable for this purpose before, is usually patentable.

Changes in Proportions

A mere change in the proportions of a composition is not invention. Thus, changing the proportions of a known alloy without obtaining any new properties does not constitute invention.

To amount to invention a change in the proportions of the ingredients must result in a new product having new properties, or the result must be an old product with new characteristics or at least with substantially enhanced qualities or utility. For example, Charles Goodyear discovered that soft vulcanized rubber can be produced by heating rubber with 6 to 20% sulphur. For this discovery he obtained a patent. Later Nelson Goodyear discovered that by increasing the sulphur 25% and upwards a hard rubber was obtained. Although this discovery was merely a change in proportions of the ingredients, a new and unknown substance was produced with unusual properties not possessed by Charles Goodyear's product. Such change was therefore held to be sufficiently novel to be patentable, for it produced a new effect.

The substitution of superior for inferior materials, or equivalent and analogous materials is not patentable. The change of size, quality, cohesiveness, or tenacity of old materials is not invention.

New Uses of Old Compounds

A new use for a well-known compound is ordinarily not patentable, but it can be patented if such new use produces a new effect or develops or makes useful some new property of the compound not previously known, provided its specific application is described and claimed in the patent. For example, the use of diphenylguanidine as an accelerator was covered in Patent No. 1,411,231 (1928) in the following language: "The process of treating rubber or similar materials which comprises combining with the rubber compound diphenylguanidine."

The Patent Office will not issue a patent with claims for the new use of a compound although allowing a claim such as the one just quoted amounts to patenting the use of a compound in an indirect manner. This is so characteristic of legal reasoning and procedure. The form rather than the substance is often the standard about which most legal battles rage, and patent procedure is no exception.

(*To be continued*)

Unusual Accidents

Reported by the Rubber Section, National Safety Council

An employe after weighing a roll of matting on a scale, pushed the hand truck under roll and at the same time had his foot behind one of the truck wheels to keep the truck from moving backward as he raised the matting. His foot slipped, and the truck with its load came down on his right leg, which was fractured above the ankle.

Vibration of the calender caused a weight on the cloth roller to work loose, dropping on the foot of the workman and causing contusion.

A belt man received severe contusions of the left arm with a possible permanent paralysis of the ulnar nerve while attempting to reach between 2 in-running rolls to grab a piece of waste from between the belt plies. These rolls were approximately 3 inches apart, allowing just enough room for the arm; otherwise an amputation would have been necessary. To prevent a recurrence of this accident, the rolls have been separated increasing the clearance between the rolls from 3 inches to 6 inches.

Is Manufacture Direct from Latex Worth While?[1]

S. D. Sutton, F.C.S., A.I.R.I., (Tech.)

IN THE two preceding articles some aspects of rubber estate problems, transport, and laboratory tests were dealt with, and now the manufacturing operations will receive due attention.

For considerable time latex compounding has presented some difficulty because many of the recognized ingredients of rubber produced coagulation. Zinc oxide, carbon black, magnesium carbonate, among others, have an opposite electrical charge and cannot be mixed into latex easily without precipitating the rubber. The introduction of protective colloids such as glue, casein, gelatin, saponin, and certain soaps has enabled a fairly high percentage of carbon black and other materials to be incorporated, but the utmost care has to be exercised in the preparation of the mixes in order to obtain even distribution of the compounds through the latex.

The ingredients should be mixed with water into a smooth thin paste and passed through a colloid mill to disperse the powders. After settling, the surplus water can be poured off and the paste then stirred into the latex. After thoroughly mixing and straining through muslin to remove any foreign matter, there should be very little settling out of the compounds. If the product is to be vulcanized, sulphur, zinc oxide, and suitable accelerators should be incorporated in the mix.

The thickening of latex by means other than concentration is to prevent the penetration of latex during proofing and to reduce the number of coats in dipping. Many patents have been taken out describing methods of thickening, but the majority make use of materials which, when added, cause partial stoppage of the Brownian movement or unstabilizes the latex. Concentrated latex in the improved qualities now available has rendered the thickening processes almost obsolete, but it is still necessary to use thickened concentrated latex for proofing certain light fabrics.

The process of latex vulcanization is well known and needs no further description except to state that for most applications of latex the advantages of not having to vulcanize it are obvious. The process has been applied to concentrated latex with satisfactory results; therefore it is possible for the manufacturer to purchase vulcanized latex and produce his goods with the minimum of equipment.

With the revival of interest in the direct use of latex some rubber manufacturers believed that latex would entirely replace crude rubber thinking that solvents would be eliminated and production costs reduced; but they soon found that the application of latex was limited.

In the rubberizing of tire fabric latex seemed an excellent medium for obtaining a better product with lower costs; processes were devised and special equipment designed to treat the cords with latex. Some very good results were obtained, but not by impregnation. It was found that the latex rubber filtered out on the surface of the fibers and could be easily stripped off. The principal benefit derived by passing the cords through a latex bath is the complete insulation of each cord by a coating of rubber. Equally good results can be obtained by immersing the cords in gum solution, and the result is better adhesion to the fibers than with latex.

The advantages of latex for proofing seem obvious, but consideration of the problems involved may raise some doubts on this point. At first it was found impossible to proof on a standard spreader as the latex ran over the spreading roller. Improvements were made on the standard machine to overcome this trouble and eventually entirely new proofing methods were evolved. The introduction of concentrated latex has made it possible to utilize the ordinary spreader, but the protective colloids used to prevent coagulation are liable to froth as the bank of mix rotates in front of the knife. The same effect is obtained, although to a much lesser degree, by using latex of lower rubber content without protective colloids, but in this case there is the additional difficulty of coagulation due to friction between the knife and the cloth. Grounding the knife and the cloth does not altogether prevent small agglomerated particles of rubber from forming, and being unable to pass under the knife, leave a line on the surface of the proofing. A continuous flow of latex from the middle to the ends of the knife eliminates these troubles to a great extent, but care must be taken to fit containers under the guides to catch the surplus latex.

From the early attempts at proofing with vulcanized latex, a very successful method of making truck covers from proofed hessian was evolved. The hessian was immersed in a bath of compounded vulcanized latex, the surplus being squeezed out between rollers and finally dried in a hot air

[1] Continued from INDIA RUBBER WORLD, Jan. 1, 1932, pp. 55-56; *Ibid*, Nov. 1, 1931, pp. 59-60.

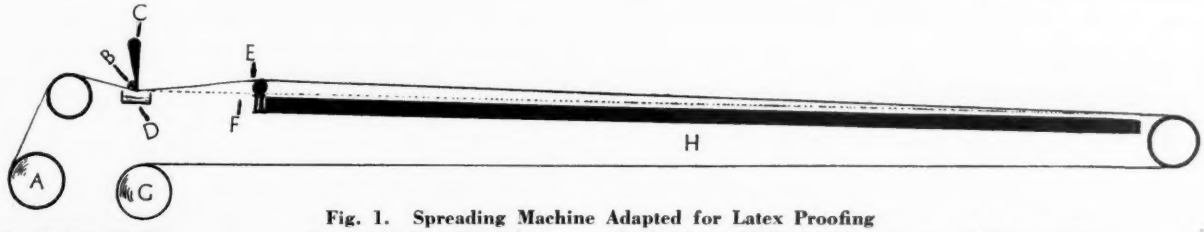


Fig. 1. Spreading Machine Adapted for Latex Proofing

A. Winding off roller
B. Latex bank behind spreading knife
C. Spreading knife
D. Trough for surplus latex
E. Roller to form V and prevent latex flowing under knife
F. Position of fabric with first coat of latex thickened for single face proofing; roller "E" removed to prevent contact
G. Winding up roller
H. Steam chest lengthened to accelerate drying

chamber. Three immersions completely filled the pores of the fabric and gave a smooth surface of abrasion-resisting rubber. See Figure 1.

The single proofing of fabrics presented some difficulty at first, especially fine silks, on account of penetration by the latex, and it was not until specially thickened latex was available that any real progress was made in this direction.

The shrinkage of the fabric due to the action of water in the latex was another problem to be faced, and stretching devices were employed to prevent undue shrinkage. Although much is claimed for the strength of latex rubber over masticated crepe or smoked sheet, this virtue has decided disadvantages as far as proofing is concerned. A lifeless rubber is essential for good proofing, and latex can make no claims in this direction. Latex proofings are inclined to riffle or form small creases because of the deposition of the latex under tension over a wide area. This, of course, applies also to spreading doughs using solvents, but the latter contains well masticated rubber whereas the latex rubber retains its full nerve.

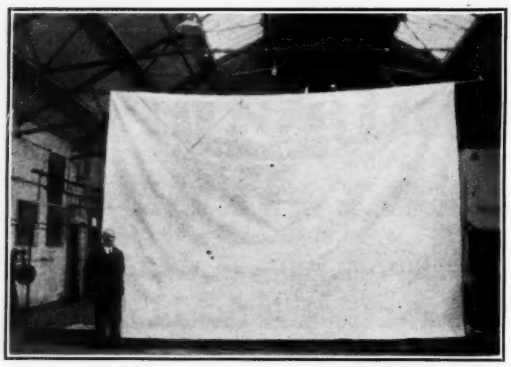


Fig. 2. Truck Cover Proofed with Compounded Vulcanized Latex

Attempts have been made to overcome this defect by introducing softeners into the latex such as oil emulsions and water dispersed substitutes. Unfortunately the addition of many suitable softeners is impossible owing to the formation of soaps caused by the action of the ammonia in the latex. This also applies to some protective colloids used in concentrated latex; the soaps formed cause frothing behind the spreading knife resulting in a porous layer of rubber.

Vulcanization is best carried out by incorporating accelerators and sulphur in the latex mix and festooning the proofed material in a hot-air chamber. Sulphur chloride curing either in vapor or liquor is quite unsuitable for vulcanizing latex proofings as the hygroscopic properties of latex rubber cause formation of hydrochloric acid, and poor aging usually results.

The ideal method for latex proofing would seem to be the use of vulcanized latex although the creasing effect described above would be accentuated owing to the extra strength imparted to the rubber by pre-vulcanization. Excellent results, however, have been obtained by this process in proofing fabrics and manufacturing spread sheet rubber. Similar methods are adopted for spreading sheet rubber, and usually a faced sheet is found to be the best base as the rubber can afterwards be easily stripped off. In order to avoid the shrinkage referred to, the base should be made of substantial cloth that will not crease with the tension of the rubber. Leather cloth is an ideal material for this purpose as it can be embossed to reproduce designs on the finished sheet rubber. Being grainless, spread latex sheet offers considerable advantages over calendered sheet for many purposes where a rubber that will not tear is essential. Care must be taken in manufacture to insure the surface of the cloth being flat and under tension until the latex has set as any indentations in the surface will be reproduced as thin or thick patches in the rubber.

A method of making thread by spreading latex over a grooved leather cloth sheet has been demonstrated, but the most promising thread made from latex has been by forcing. Two methods at least are in commercial use—one in which the latex is forced through nozzles into an acid bath, when coagulation takes place at once and the thread rises to the surface of the acid. It is then washed, vulcanized, dried in hot air, and coiled on a spool.

The other method, which has only recently been developed, makes use of heat as a setting agent. Metallic salts, such as magnesium and calcium sulphate, are incorporated with the latex, and these have the effect of producing coagulation on heating. In thread manufacture the treated latex is forced through a tube which is heated sufficiently to produce a coagulated thread when the latex leaves the nozzle. Vulcanization is effected in hot air or hot water. By this method, tubing can also be made having high tensile and aging qualities.

Deposition as distinct from dipping is a branch of rubber manufacture exclusive to latex and has developed in 2 directions: namely, the electrical and the heat deposition processes, to which reference has been made. The electrical deposition has for some time been carried out on a large commercial scale, and among the varied applications the covering of wire and chemical apparatus has also been very successful.

The heat process depends on the unstabilizing of the latex by the action of metallic salts. A form is heated in boiling water or internally heated by an electric element and immersed in the latex mixture. In a few seconds a thick deposit is formed which is dried, vulcanized, and stripped from the form, yielding a product of high tensile strength. This process has been successfully applied to the manufacture of inner tubes, bathing caps, gloves, etc.

Dipped goods made by immersing forms into latex are still very popular, as latex lends itself to this method of manufacture, and there are perhaps a few less difficulties to surmount before the commercial stage is reached. It must not be thought, however, that the dipping process is simple, for it has taken years of patient research by the firms who have succeeded in establishing latex dipped goods on the market. Viscosity, temperature, and variability are obstacles entering fully into dipped goods manufacture with latex; and consideration must be given to the modern accelerated vulcanizing processes of dipped goods made from gum solution which yields products with good aging properties and high tensile strength.

Molding latex mixings in the form of sponge is one of the latest and most ingenious applications and has been fully described in this journal. This process has been further developed to embrace the manufacture of cellular ebonite which has found use in the electrical industry and in refrigerator insulation.

Shoe and poster cements, hair and fiber mixtures for upholstery, can sealing compounds, and paper are a few of the latex applications outside of general rubber manufacture, and it is these new branches that absorb the greater part of the latex imports.

It has been recently claimed that perfect road materials have been made from asphalt-latex and cement-latex mixes, but more time is required to determine the success of these materials. Rubber roadways have presented difficulties which, up to the present, have not been completely surmounted, the all important question of price being one of the main factors.

From a study of the foregoing latex developments, what is there to encourage the rubber manufacturer to change over to the direct use of liquid rubber? The advantages and disadvantages of latex may be summarized in the following tables.

For the Direct Use of Latex	Against the Direct Use of Latex
1. Elimination of solvents and fire risk minimized.	1. High cost. Latex rubber at least twice the cost of crepe or smoked sheet.
2. No mastication or calendering.	2. Variability.
3. Superior aging qualities and tensile strength.	3. Products much stiffer owing to non-mastication and serum substances.
4. Application to new materials and processes impossible with ordinary rubber.	4. Hygroscopic nature of latex rubber.
5. Higher concentration possible than with rubber solvents.	5. Low dielectric strength.
6. Can be vulcanized in the fluid form.	

These articles are intended to enlighten the smaller manufacturer possessing little knowledge of latex regarding the difficulties in producing a salable product.

What, then, does the future hold for latex?

The question "is it worth while" must often be raised by many of the pioneers of latex goods manufacture, and as each particular problem is solved and yet another milestone passed, the fact that the imports of latex into the United States are increasing yearly shows the answer. It would seem then that the main future for latex lies not so much in replacing the older methods of rubber manufacture such as dipping, spreading, etc., for it has its limitations in these directions, but in the evolving of entirely new processes and its combination with materials used in other industries.

It is conceivable that in a few years many new products incorporating latex will be available, manufactured in factories having little in common with the rubber factory as we know it today.

Research and patience are the essentials in latex processes, and success is assured for those who show sufficient initiative and faith in their ultimate objective.

Industry and Trade

From National Industrial Conference Board

Motor vehicle production in the United States and Canada in March is estimated at 130,700 cars and trucks. This total is an increase of 6% over February but at a level 55% under that of March last year. In recent years the February to March movement was, on the average, a 26% increase.

During the first quarter 376,665 units were produced, as compared with 697,553, or a decline of 46% under output in the first 3 months of 1931.

Retail sales in March were slightly larger than in February, but the gain was considerably less than the normal spring increase.

Exports continue at about the same level as in January and February, sales of passenger cars outside the United States taking about 10% and of trucks, about 28% of the motor vehicles that were produced in the United States and Canada.

Consumption of crude rubber in March by manufacturers in the United States declined by 7% under consumption in February to a total of 27,828 long tons; the average movement between the 2 months in recent years was a 10% increase. Crude rubber stocks on hand at the end of the month, totaling 334,566 long tons, showed an increase of 4% over stocks at the end of February.

Consumption in March was 15% under what it was a year ago, while stocks on hand were 54% larger than they were at the end of March, 1931.

The Ventube System

A Rubberized Portable Conveying Duct for Secondary Ventilation

THE Ventube system of auxiliary ventilation for mines and tunnel construction comprises a line of Ventube and its necessary accessories coupled to a compact, motor-driven fan unit. The system is in use in the construction of New York City subways where despite powder fumes, dust, and carbon monoxide gas the men engaged in tunneling are supplied with fresh air brought by the Ventubes right to the working faces.

Du Pont Ventube in a Coal Mine

The Ventube is a rubber product made by impregnating and coating specially selected fabrics with a high grade rubber compound rendering the tubing absolutely waterproof. A special treatment is applied to the fabric before coating and also incorporated in the rubber composition. This construction makes the tubing highly resistant to fungus growths, acid and alkaline waters, vitiated air, and all such conditions encountered in mining and tunneling. Thus long life and proper functioning of the tube are assured in underground service.

The Ventube system is being successfully used in practically all types of mining in all the important coal fields of the country where it has provided a safe and efficient method of reducing costs in mining by making possible economies in operation that would not be practical without its use. The illustration pictures a line of tubing in position in a coal mine and shows how its flexibility lends itself to the curve at this point.

Ventube is equipped for easy and time saving installation with special couplings, suspension hooks, etc. It is the conveying duct for a complete portable system of secondary ventilation.

EDITORIALS

Regulator for Tire Industry

OPTIMISM in rubber circles was decidedly revived by the recent report that leading tire manufacturers were earnestly studying plans whereby merchandising could be practically consolidated and a great deal of loss and waste eliminated, without conflict with the Sherman Anti-Trust Act. It was even announced that a regulator with ample power had been tentatively proposed in the person of George T. Bishop, president of the Continental Shares Corp., his appointment and the launching of the new administrative scheme being contingent on the advice of counsel as to the entire legality of the undertaking.

Of peacemakers in production and distribution tire makers have had their fill. What they need more than anything else is a capable peacemaker if they are ever going to get their proper share of prosperity. Thirty-two companies are said to have subscribed in principle to this newest move toward sanity in the rubber business, so long reproached by industrialists in other fields for its lack of unified enterprise and its glorification of mere mass or volume production to the utter disregard of profit and stability.

There is no practical reason why such a plan should not succeed. In industries that are quite as complex, to mention only that of motion pictures, one-man control wisely planned has not only brought order out of chaos but has checked insensate rivalry, developed higher standards of credit and management, and insured ampler and more consistent profits. "What man hath done, man can do" applies to the tire industry as forcibly as to any other. It is gratifying to note that leaders are at last seeing a light that leads somewhere.

Automobile Industry Leads Recovery

EDITOR JOHN H. VAN DEVENTER, of the *Iron Age*, one of the keenest readers of the business barometer, finds much to commend in the decision of the American automobile industry to take the lead in breaking up the jam which recently almost paralyzed the commercial world. Others might be content to bide their time, but the automobile industrialists, chafing under the fear that was benumbing business everywhere, resolved that they at least would be free even if it took an heroic effort to overcome the inertia existing in their particular field.

They are showing the true, indomitable spirit that has made America great in launching the most aggressive drive against depression that any industry has ever made anywhere. They are pouring millions of dollars into sales efforts of an unheard-of magnitude, and the campaign is breaking down buyer resistance astonishingly. It is being proved that a multitude have the means to buy and that, if properly persuaded, they will quickly cease thinking that buying is no longer fashionable.

Other industries may well take their cue from the automobile leaders. There is more wealth in the country than ever before, and there is a vast amount of business to be had if resolute effort be made to obtain it. It will require liberal, well planned advertising and intelligent, determined salesmanship, but the reward of such courage will be found early and ample. Biding one's time gets one nowhere.

Advertising Agency's Function Changing

THAT within 10 years manufacturers will be able to give their whole time to engineering and efficiency and that the complete styling, promoting, advertising, and designing will be done by a merchandising agency is the prediction of Walter Hoving, vice president and merchandising manager of R. H. Macy & Co., New York, N. Y. Through such an institution the producer, he predicts, will be able to get his merchandising job done infinitely more effectively and at less expense than he can possibly do now with present hit-or-miss methods. If creative merchandising, he contends, were on as high a plane as creative advertising, the business of this country would benefit tremendously. We must develop the field of design.

DIVIDENDS MAY YET BE DECLARED BY MANY RUBBER planting corporations operating at a loss on account of the extremely low cost of rubber. An observation made about a century ago that the silk-worm has a particular fondness for the leaves of rubber bearing plants has been revived. Indeed, the worms consume such leaves with avidity when caoutchouc-bearing mulberry leaves are scarce; and a caterpillar feeding on rubber trees in the Amazon country is said to produce a tough, coarse filament. Hence if rubber raisers cannot make money selling latex and coagulum, they might just as well go in for silk culture.

What the Rubber Chemists Are Doing

Tests with the Accelerator-Activator Barak[1]

OWING to the interest displayed at the fifth meeting of the German Rubber Association at Eisenach in May, 1931, regarding scientific tests with Barak made by Hauser, more complete details are now given, particularly as some of the findings differ from those published by du Pont.

The tests by Hauser and Wolf showed that when Barak is used in masticated mixings, the accelerator content may be considerably reduced without causing a diminution in the resistance to rupture. The plateau effect is improved. The sulphur content can be drastically lowered without preventing complete vulcanization. While this information is of theoretical interest as far as the working of crude rubber is concerned, it has a real interest in working latex since in many cases it is desirable to reduce the quantity of ingredients in powder form to a minimum.

It may further be mentioned that when Barak is used in crude rubber mixings even when containing as much as 3 per cent of sulphur, no blooming whatever occurs even weeks later; whereas similar mixings without Barak bloom completely within a few days. This prevention of sulphur blooming is particularly interesting in the manufacture of transparent films or sheets which may be made up to 1cm. thick and will still retain their transparency permanently.

Barak can also successfully be used in working latex and Revertex. It is possible considerably to reduce the content of sulphur, zinc oxide, and accelerators. Attention is called to the fact that Barak was considerably more effective in unmasticated Revertex mixings than in masticated Revertex mixings. The reason for this effectiveness, it was suggested, might be that the surface of the rubber substances reactionable during vulcanization is considerably smaller in unmasticated than in masticated rubber.

[1]E. A. Hauser and H. Wolf, *Kautschuk*. Oct., 1931. pp. 186-88.

Synthetic Rubber[1]

G. R. Whitby[2]

THE author traced briefly the history of early attempts to synthesize rubber and went into some details regarding the work carried on in England and Germany just prior to the War. The English workers used fusel oil as a starting point, and their work really led up to the discovery of the fermentation process for butyl alcohol; while the Germans worked with phenol, converting it to cyclohexane and thence to butadiene. Mr. Whitby mentioned that a 60% yield of butadiene had been obtained from the cyclohexane of natural gas in the laboratories of the National Research Council. The isoprene chain exists in terpenes, carotine, squalene, phytol, cholesterol, and other plant complexes, but only recently was the connection made in the laboratory, when geraniol was synthesized from isoprene. During the War the Germans turned out synthetic rubber at Leverkusen, from acetone via dimethylpinacone, but the product did not compare with natural rubber.

The recent work has been carried out by the I.G. in Germany and the du Pont company in the United States. The former group have given particular attention to methods of polymerization. It has been established that the polymerization of dienes takes place much more rapidly if carried out in emulsion; by polymerizing with sodium and heat to a certain stage and continuing the condensation in emulsion at lower temperatures, a mixture of polymers is obtained which more closely simulates the properties of natural rubber than does the product of either method alone. Mr. Whitby drew a parallel between the action of sulphur with drying oils and with rubber. Vulcanization catalysts act also to catalyze the drying of linseed and similar oils.

The work carried out by du Pont is based on the observation of Father Nieuwland that, if acetylene is led into a saturated solution of cuprous chloride and ammonium chloride and heated, the gas is regenerated, but if the mixture is allowed to stand for 120 hrs., polymers of acetylene may be distilled off. These are mainly the dimer and trimer, C_4H_4 and C_6H_6, with some C_8H_8. The C_4H_4 polymer is vinylacetylene. When this is treated with hydrochloric acid, chlorobutadiene (or chloroprene) is formed, having the structure $CH_2 = C(Cl)—CH = CH_2$. The double bond is rendered highly polar and very reactive by the introduction of the chlorine, thus conducing to rapid polymerization. If kept at 25° C. for 10 days, polymerization is complete. If emulsified with a small amount of, say, sodium oleate, it polymerizes in 24 hours at 10° C. The polymers have rubber-like properties. The tensile strength is slightly less than that of the natural product, being about 140 kg./cm., and the polymer has a breaking extension of 800%. A special feature of the polymers is that sulphur is unnecessary to effect vulcanization.

This "DuPrene," as it has been named, has 3 special properties. It does not imbibe solvents to the extent of natural rubber and, hence, shows a greater resistance to the action of oils and gasoline. The latex has smaller particles than natural latex (0.05 to 0.07 micron compared with 1.0 micron); hence it has more penetrability. It polymerizes so readily that it offers attractive possibilities of forming rubber *in situ*, by impregnating substances with the emulsion and allowing it to polymerize. As to the commercial future, Mr. Whitby was unwilling to prophesy, but he believed that there is a possibility of the product competing with natural rubber when more normal prices for the latter prevail. The whole project is still in the development stage, and the plant erected by du Pont is a purely experimental one, with a capacity of 600 pounds a day.

During the discussion it was brought out that the synthetic product has a higher specific gravity than the natural one, the figures being 1.23 and 0.92. It was also stated that "DuPrene" ages better than natural rubber.

[1]Paper presented at a joint meeting of the Toronto Chemical Assn. and the Toronto Paint & Varnish Production Club, held at the Royal York, Toronto, Canada, Feb. 20, 1932. Abstract from *Can. Chem. & Met.*, Feb., 1932.

[2]Director of the chemical division of the National Research Council of Canada.

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RECENT PRODUCTS WITH LATEX BASE IN PATENT LITERATURE. R. Ditmar, *Caoutchouc & gutta-percha*, Mar. 15, 1932, pp. 15913-14.

WATERPROOFING LEATHER AND ARTIFICIAL LEATHER IN PATENT LITERATURE. R. Ditmar, *Caoutchouc & gutta-percha*, Mar. 15, 1932, pp. 15914-15.

UNSOLVED RUBBER PROBLEMS. E. Wurm, *Kautschuk*, Mar., 1932, pp. 38-40.

NEW AND OLD METHODS IN BALL DECORATION. *Gummi-Ztg.*, Mar. 25, 1932, pp. 873-74. (To be continued.)

MANUFACTURE OF RUBBER FOOTWEAR. W. Schlitt, *Gummi-Ztg.*, Mar. 18, 1932, pp. 843-44.

ON THE FORMATION OF GELS IN SOLUTIONS OF RUBBER CONTAINING RAPID ACCELERATORS. M. R. Thiollet, *Rev. gén. caoutchouc*, Feb.-Mar., 1932, pp. 5-9.

Aging of Rubberized Fabrics[1]

The main points are discussed in the manufacture of single and double textured fabrics for raincoats, automobile tops, hospital sheeting, card clothing, printers' blankets, etc. The author points out that the quality of the basic fabrics is of prime importance since these are apt to contain amounts of manganese and copper that may prove harmful. Thus certain artificial silks which had not been properly washed, contained 15 mg. of copper per square meter. Dyes containing the metals mentioned also have a deleterious effect. It is noteworthy that whereas the presence of 5 mg. of either metal per square meter has a deteriorating effect on natural and artificial silk, even a content of 10 per cent produces no harmful effects with cotton and woolen fabrics.

In single textures the rubber mixing should be such as to show optimum aging properties without the addition of protectors since the latter frequently affect the color. For best results rapid cure at a low temperature with ultra-accelerators is advised, and to avoid blooming a minimum of sulphur and rather more accelerator are suggested. Thus 1½% of sulphur gave excellent results with Vulkacite F. Guanidines should be excluded as accelerators and only used, if at all, as activators, for instance with Vulkacites Mercapto and D. M.

The above suggestions also apply to rubberizing double-textured fabrics, except that as here the color is of less importance, antioxidants may be included if desired. The practice in France and the United States of finishing automobile top fabrics with quick-drying linseed oil varnishes is inadvisable, as siccatives generally contain manganese and, particularly in American rubberized fabrics, rapidly produce a deleterious effect. Wurm states that successful attempts have been made in France to overcome the difficulty by using rubber only between the fabrics and coating the outside directly with nitro varnishes.

For aging tests, the Geer oven test, continued for 8 days, is best particularly for cold cured fabrics. The 90-hour test in the aging bomb is preferred for hot cured fabrics. These fabrics are first exposed to the outside air for a period of 8 days in summer and a correspondingly longer period in winter before being placed in the bomb. Fabrics that must be resistant to oils and chemicals are first treated with these substances and then put into the bomb. Tests with ultra-violet light are held quite misleading as this light differs considerably in composition from sunlight. Rubberized fabrics which have been found to change greatly under violet light showed little or no deterioration as soon as constant cooling by ventilation or lessening of the ozone concentration was provided so that the harmful effects are rather to be sought in the action of heat rays or ozone.

[1] E. Wurm, *Gummi-Ztg.*, Nov. 6, 1931, pp. 187-90.

A. C. S. Meeting

Boston Group

The spring meeting of the Boston Group of the Rubber Division, A. C. S., held April 7 at the Hotel Continental, Cambridge, Mass., was attended by 125 members and guests. The following chemists were unanimously elected officers for the current year: chairman, Warren E. Glancy, Hood Rubber Co., Watertown, Mass.; secretary-treasurer, J. J. Sindler, Converse Rubber Co., Malden, Mass.

The entertainment feature of the evening was a lively and interesting illustrated talk by A. H. Blackington of the *Boston Herald*, on the "Romance of News Gathering" based on his personal experience as a news photographer.

The scientific program consisted of a paper on "Some Heat Effects of Vulcanization" by Prof. W. K. Lewis, of the Massachusetts Institute of Technology. He pointed out that no theory of the mechanism of vulcanization yet presented is adequate to explain all the facts that have been obtained. The most striking of these are that for highly accelerated mixes containing varying amounts of initial free sulphur, the disappearance of free sulphur follows the rate law of a first order chemical reaction, being monomolecular with respect to the free sulphur. However in the case of mixes containing a poor accelerator, or none at all, the rate of disappearance of free sulphur is constant or even increases with the time of cure.

This behavior can not be explained on the basis of the limited solubility of sulphur, autocatalysis, nor the depolymerizing action of heat. Tests made on rubber preheated at curing temperatures for 20 to 300 minutes before the sulphur was incorporated showed that the preheated rubber combined with less sulphur than in a corresponding cure made with unpreheated rubber. This effect is diametrically opposite that predicted by the depolymerization theory. Moreover, at the same combined sulphur, the tensile strengths of the preheated and unpreheated cures were identical.

As to the cause of the slowing down of the vulcanization reaction by preheating, it is suggested that the preheating may develop an anticatalyst or antiaccelerator, inhibiting the vulcanization reaction in the early stages of cure but, when the sulphur addition finally starts, its rate is identical with that of unpreheated rubber. This effect is entirely similar to that of antioxidants in inhibiting the oxidation of rubber, where the antioxidants merely lengthen the induction period of the reaction but have no effect on its ultimate rate.

Latex and Dispersions

Latex and Insulation

G. D. Kratz

INSULATION in the broadest sense is probably most often regarded as the application of a material which prevents or assists in preventing the transfer of some type of physical energy. Electrical energy, sound, heat, and a variety of other effects require insulation. Usually the desired results can be obtained either by the use of a material with inherent insulating properties or one which permits the formation of a composition with insulating properties.

One of the best insulators for most types of energy is the application of a high vacuum at or near the source of the effect. Unfortunately for practical purposes the use of a vacuum is restricted to electric bulbs, thermos bottles, and other articles of a similar character. However to approximate the vacuum effect a large number of products are on the market which have high insulating values due to the formation of countless small cells of air which are held entrapped by other materials. The building trades especially have made good use of this principle.

Since the earliest days of the industry rubber has been associated with electrical insulation. In combination with other substances it has constituted the chief constituent of wire and cable insulation. For many years switchboard panels were made almost exclusively of hard rubber. More recently a cellular type of hard rubber somewhat similar to soft sponge rubber in construction has also found a place on the market. However applied, rubber still remains one of the few substances with relatively high dielectric properties.

In the past the cellular forms of both soft and hard rubber have been made by incorporating volatile substances in the rubber mix and vulcanizing in molds which permitted a given amount of expansion with consequent cell formation. More recently attention has been drawn to the use of latex for the manufacture of cellular rubber structures. Air or other gaseous material is stirred into the latex and the resultant product allowed to set or vulcanize.

Latex presents a multitude of opportunities in the manufacture of such cellular articles, particularly in connection with other substances for the manufacture of insulating materials not only for electrical insulation, but more especially for preventing the transfer of sound and heat.

A wide variety of new materials is marketed in connection with the extended use of artificial refrigeration. Soundproof rooms for office and apartment buildings, motion picture and radio studios have created other new requirements for insulating materials.

Most of the newer products now on the market for these purposes are composed of fibrous materials in pulp form, in various degrees of compression, held together with adhesives as binders. Wood, cork, bagasse, and corn stalk fibers comprise the bulk of many of these materials. Glue, gelatine, and other adhesives alone or in combination with other substances, which in some cases are said to render the final product fire resistant, are often used as binders.

As the physical characteristics of these materials vary widely for the purpose intended, and as few, if any, of them are strongly fire resistant, latex should find a wide field of application as a binder. Further, as a large proportion of these materials owe their insulating properties to their cellular structure, they are particularly adaptable for the inclusion of latex to assist in maintaining the integrity of the individual cells.

An interesting type of heat insulation now on the market is composed of a specially prepared "wood-wool" which in appearance is not entirely unlike the animal product. It is composed of specially treated wood pulp, is soft, fluffy, and said to be fire resistant. It is felted into pads one half or one inch thick. The felted pad is protected on either side by a sheet of heavy kraft paper attached to the pad by an adhesive. When put up in this manner, it is sold in rolls of standard width and length. The material in its final form is flexible, readily handled, and said to be extremely efficient as a heat insulator. Presumably it also effects insulation against sound. It would, however, be interesting to test the relative merits of a product of the above type if latex were incorporated in the mixture at least to the extent of insuring greater integrity of the individual air cells.

The above type of insulation has been described briefly to illustrate most clearly a principle that has been applied in the manufacture of a variety of products now on the market and which differ essentially from each other only in their degree of density. The insulating value of a large number of wall boards, pressed fiber tiles, and other products of a similar character all apparently rely upon the same principle. In no instance noted, however, would it appear that latex could not be used if desired, either as a binder or to assist in maintaining cell formation.

In the foregoing examples the materials have been designed for what might be called general construction purposes. Latex, if used in the manufacture of materials of this type, would probably be incorporated in the mixture in relatively small amount as compared with the weight of the pulp. On the other hand, a larger percentage of latex in the mix might result in a building material with valuable properties for preventing the occurrence of inaccuracies in delicate electrical instruments. Variations of this type have long been a dangerous hazard in the wheel house of marine vessels and the cockpits of airplanes. The use of latex in larger amounts should also permit the ultimate manufacture of strong, light, and even flexible wall board with high dielectric properties which would be of greatest value and embody excellent protection against outside electrical disturbances.

The possible use of latex in the above field is not without difficulties. Nor, on the other hand, would these obstacles seem to be insurmountable. When used to maintain the integrity of cell formation, good aging properties are essential; as a binder it must age equally as well as the substances now employed for the same purpose. It must be odorless and remain so under the conditions to which it is subjected even after periods of years. It must not resinify or alter its physical condition in a manner which will attract insects or vermin. It must be fire resistant or at least slow burning. Recent developments in antioxidants, deodorants, and the pigmentation of solutions would seem to permit of the application of latex in this branch of the building industry in the near future.

In its broadest sense the term insulation may be said to include waterproofing as applied to roofing materials. It is doubtful if a latex composition could be prepared at this time which would compare favorably with the mineral preparations now on the market for the same purpose, but it is possible that a composite material of superior qualities could be developed. Many asphaltum roofing materials have long life and excellent waterproofing qualities. Few of them, however, give the desired protection against heat conditions. A composite roofing material, with a base of latex treated pulp, coated with asphaltum preparation would appear to combine waterproofing and heat insulation qualities not now found in other products on the market for the same purpose.

The possibilities in latex treated thread for the insulation of small wires and the use of latex impregnated fibers as a cable filler has been commented upon in a previous article. The use of rubber, including

latex, with asbestos is well known in the case of brake lining and other friction surfaces. In fact rubber has long been recognized as embodying most of the qualities desired in electrical heat and sound insulation. With the exception of its electrical applications the difficulty has been to utilize it effectively and economically. The use of latex opens up an entirely new field for development along these lines.

Latex and Reclaim

A NEW method of reclaiming vulcanized rubber has been patented by Metallgesellschaft A.G., Frankfurt a. M., Germany, in which the material is converted into a watery dispersion which can be used in that state or combined with natural or concentrated latex.

Waste and old rubber, together with a peptonizer as soap, glue, casein, gelatine, saponin, etc., are worked in a mill or other suitable mixing machine until the rubber is disaggregated and the peptonizer is evenly distributed through the mass. The resulting product easily dissolves to a semi-fluid, finely dispersed mass when water or watery solutions are added. Combined with vulcanizing agents and where desired with latex, the material is ready for use, being especially suitable for rubberizing fabrics.

Sprayed Inner Tubes

ANY coagulable aqueous rubber dispersion such as natural latex mixed with the necessary vulcanizing and other ingredients may be coagulated upon a receiving surface by being sprayed with a coagulating vapor or mist. It is preferable to concentrate the latex with the addition of the necessary alkali or other stabilizing ingredient before spraying, thereby greatly reducing the time required for drying the formed article. When ready for the spraying operation, the compounded latex has the consistency of thin syrup. The deposit of coagulated rubber is dried in any convenient manner. Either soft or hard rubber may be produced by vulcanization of such deposits.

If the rubber is to serve as a permanent coating, it is applied over a thin layer of rubber cement such as is commonly employed in vulcanizing rubber to wood, metal, or other surfaces.

In making inner tubes a smooth mandrel of the proper diameter is rotated slowly while a combined spray of 50% acetic acid, and of latex containing sulphur, accelerator, zinc oxide, etc., in the proportions necessary to give the rubber the desired characteristics during and after vulcanization, is directed, either manually or by an automatic machine, over the length of the mandrel until a deposit of the proper thickness is produced. A strip of cloth is then wound spirally over the wet coagulated rubber in order to express, in large part, the contained water. The deposit is then dried in a heated chamber or in a vacuum, vulcanized in any convenient manner, say in open steam, stripped from the mandrel, the valve stem inserted, and the ends spliced in the usual manner.

Vulcanized Latex Dipped Footwear[1]

BATHING shoes are made from latex according to English practice in the following manner.

The lasts are dipped into a vulcanized latex compound which, when dried off in hot air current, gives a white lining to the shoe. An insole is then attached, made from specially hard wearing rubber to which vulcanized latex will adhere. Two further coats of compounded vulcanized latex are given, followed by a dip in colored latex. The outsole is then applied by a machine designed to give, when the shoe is immersed, the correct contour of the sole. The mix for the outsole is compounded to withstand hard wear and after application to the shoe is immersed while wet into a suitable solvent. During the short period elapsing between dipping in the vulcanized latex mix and the solvent, a thin skin of dry vulcanized rubber has formed with a layer of wet rubber between it and the dry under coats of the shoe. Immersion in the solvent causes the outer skin to wrinkle, swell, and slowly to coagulate the wet vulcanized latex below. This action results in a roughened surface giving a non-slip sole to the shoe.

The roughening process lends itself to the production of novel effects on the surface of the shoe. If colored mixes are sprayed on before immersion in the solvent, mottled and jazz effects are obtained. Similarly a crepe effect may be obtained on the surface by giving a final dip in transparent vulcanized latex before roughening in the solvent. After drying, the shoes are decorated, stripped from the lasts, inspected for flaws, and packed in attractive cartons ready for shipment.

By using highly concentrated vulcanized latex it is possible to reduce the number of dips to 2 for a shoe of standard thickness, but this process results in a much longer drying period being necessary, as once the outside of a thick coat becomes dry, it is difficult for the moisture inside to escape. By using a less concentrated mix it is possible to eliminate air bubbles which persist in high concentration where the surface is continually disturbed by constant immersion of forms necessary for rapid production.

No after-vulcanization is necessary in this process. The vulcanization of the latex is controlled before the shoes are made, thus insuring a correct cure and the maximum strength and durability. Another feature of this process is that an extensive range of dyes can be used that would be destroyed by heat vulcanization.

[1] "The Application of Vulcanized Latex to the Manufacture of Rubber Footwear." S. D. Sutton. *India Rubber J.*, Oct. 3, 1931, p. 436.

Coagulating Latex

IT HAS been found that coagulation may be effected just as quickly by treating latex with highly active proteases as by the processes commonly known, and in a harmless manner. Latex which has been stabilized with ammonia may also be coagulated in this manner if the ammonia be wholly or partially eliminated by an air blast or by neutralization. According to the amount and kind of the highly active protease employed the coagulation may be effected in different ways both as regards time and from the chemical point of view. It is thus possible to obtain various kinds of rubber from the latex.

Patents

United States

1,847,123. **Latex Composition.** F. S. Malm, Chicago, Ill., assignor to Western Electric Co., Inc., New York, N. Y.

1,848,135. **Leather Surface Coating.** B. Mead, Belmont, Mass., assignor to United Shoe Machinery Corp., Paterson, N. J.

1,849,246. **Aqueous Rubber Dispersion.** E. A. Murphy, Wylde Green, and A. Niven, assignors to Dunlop Rubber Co., Ltd., both of Birmingham, all in England.

1,849,920. **Hard Rubber Dust.** W. A. Gibbons, Montclair, N. J., and E. Hazell, New York, N. Y., assignors to the Revere Rubber Co., Providence, R. I.

1,850,673. **Treating Latex.** H. C. Howard, assignor to American Anode, Inc., both of Akron, O.

Dominion of Canada

320,454. **Aqueous Rubber Dispersion.** Dunlop Rubber Co., Ltd., London, England, and Anode Rubber Co., Ltd., Guernsey, Channel Islands, assignees of E. W. Madge, Birmingham, England.

320,654. **Surface Ornamentation.** Dunlop Rubber Co., Ltd., London, England, and Anode Rubber Co., Ltd., Guernsey, Channel Islands, assignees of E. A. Murphy and E. W. B. Owen, co-inventors, both of Birmingham, England.

320,755. **Rubber Electrodeposition.** Anode Rubber Co., Ltd., Guernsey, Channel Islands, assignee of P. Klein, Budapest, Hungary.

320,912. **Rubber Powder-like Composition.** Dunlop Rubber Co., Ltd., London, England, and Anode Rubber Co., Ltd., Guernsey, Channel Islands, assignees of E. W. Murphy and D. F. Twiss, co-inventors, both of Birmingham, England.

United Kingdom

361,880 and 361,941. **Latex Molded Products.** Metallges. A.G., Frankfurt a. M., Germany.

361,965. **Aqueous Dispersion Product.** Anode Rubber Co., Ltd., Guernsey, Channel Islands, assignee of H. C. Howard and E. S. Kern, both of Akron, O., U. S. A.

362,814. **Latex Compound.** Goodyear Tire & Rubber Co., Akron, O., U.S.A.

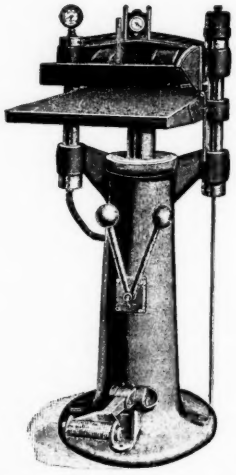
362,845. **Latex Compounding Ingredient.** I. G. Farbenindustrie A.G., Frankfurt a. M., Germany.

363,324. **Dispersion Stabilizer.** Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij, The Hague, Netherlands.

Germany

546,688. **Treating Latex.** Metallgesellschaft A. G., Frankfurt a. M.

New Machines and Appliances



Rubberprint Electric Curing Press

Electric Vulcanizing Press

RUBBER manufacturers of molded rubber specialties that can be handled in small presses will find the single opening electric vulcanizing press here illustrated excellent for the purpose.

This press is built in 3 models with heating surfaces of the following dimensions: 15¾ by 18⅛ inches, 19¾ by 23⅝ inches, and 24 by 30 inches. The smallest size operates at 22,000 pounds' pressure, and the other sizes at 45,000 pounds. Pressure control is applied by a foot power oil pump. The press is equipped with thermostatic control and is considered superior in efficiency, safety, and over-all economy to the usual steam heated small hydraulic press for vulcanizing rubber. Also the electric vulcanizer does not heat up the entire press room. There is so little radiation from the press that its heat cannot be felt at a distance of one foot from the machine.

While designed for vulcanizing rubber for stamps and printing plates, these presses are adapted for laboratory use and the commercial production of molded small rubber articles generally in plant locations where electricity is available more conveniently than steam. Rubberprint Equipment Corp., 200 Varick St., New York, N. Y.

Self-Acting Temperature Regulator

THE most important improvement in the self-acting regulator here pictured is the practical elimination of friction making its over-all performance vastly superior. In all self-acting regulators of the direct bellows and stem-connected type, the movement of the valve stem is intended to be proportional to the change in temperature of the bulb. The theoretically perfect action is that the position of the valve should always be the same for a given bulb temperature and should move in direct relation to changes of bulb temperature. In practice the accomplishment of this ideal is hindered by the element of friction. This element seriously interferes with the operation of most regulators of the self-acting type, manifesting itself by the inability of the valve stem to assume the same position for the same bulb temperature. Actually what occurs is that the bulb temperature must be changed several degrees before the valve stem starts to move.

Another element which contributes greatly to the superior performance of this regulator and its adaptability to the greatest variety of applications is the construction of the tube system. This consists of a double seamless bellows, extra heavy walled copper connection tubing, and stainless steel bulb of exceptionally small size and thin wall. This tube system requires a minimum volume of actuating medium, which makes a small bulb possible and together with the thin wall of the bulb and its shape results in a system that responds quickly to temperature changes.

Among the practical applications suggested for this self-acting temperature regulator are hot water service tanks, glue kettles, water storage boxes, hot water circulating systems, drying rooms, and open baths. Taylor Instrument Companies, Rochester, N. Y.

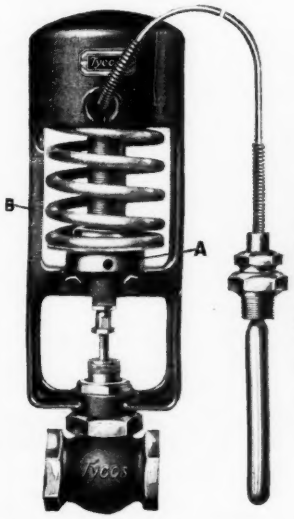
Quick Opening Door

THE vulcanizer door represented in the illustration has special claim for consideration because of its patented construction for quick and easy operation and making a steam-tight seal. The door is suspended from the hinge arm at a point in its center, giving a swiveling action which keeps the door concentric with the center axis of the shell when being closed. The hinge is provided with screws which permit the door to be adjusted exactly with the center of the vulcanizer shell. The locking ring on the shell casting is moved by rack and pinion. The door and locking mechanism can be easily applied to vulcanizers now fitted with old style doors. Baldwin-Southwark Corp., Southwark Foundry & Machine Co. Division, Philadelphia, Pa.

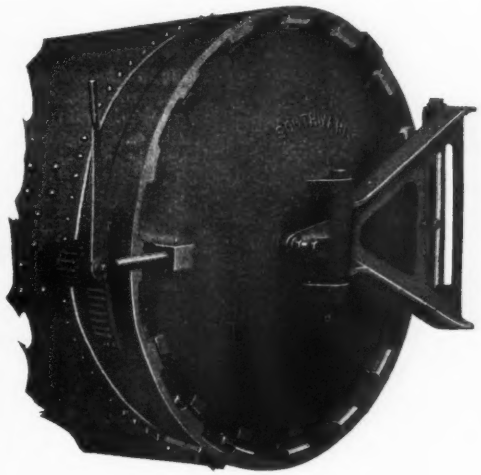
Herringbone Pinions As Pump Rotors

FARREL-SYKES herringbone gears have a world-wide reputation for use in the transmission of power. They have, however, other applications not so well known. The illustration shows a pair of pinions used as impellers, sometimes called cams and rotors, for the gear type of pump. They have numerous advantages for this purpose. Pumps made with these gears are more efficient mechanically and volumetrically. They can run at a very high speed. The smaller sized pumps are used with motors directly connected to them, running up to 1,800 r.p.m. Such pumps are often used for high pressures; 1,000 pounds per square inch is standard with some makers using these gears, and in some special cases the gears are used for pressures up to 1,500 pounds per square inch.

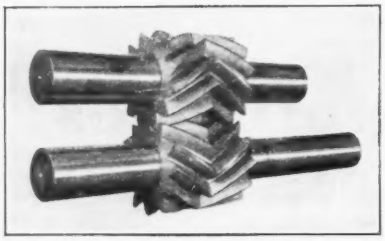
The application of these gears to large capacity pumps has recently become general. Those shown in the illustration run



Tycos Temperature Regulator



Southwark Vulcanizer Door



Farrel-Sykes Pump Rotors

at 435 r.p.m. and pump 625 gallons per minute against a head of 200 pounds. A pump of this kind is very small for its capacity; no reduction gears are required; consequently it is economical to manufacture. Farrel-Birmingham Co., Ansonia, Conn.

Flue Cleaner Coupling

THE flue cleaner hose coupling here pictured is designed to meet all flue cleaner hose requirements. It is a compact, boltless coupling of the compression type. When the sleeve is screwed up on the stem, the 3 internal segments compress the hose and make a tight, leakless connection. The wire winding on the hose is threaded through one of the segments of the coupling and bent back to prevent the possibility of the coupling or the cleaner blowing off. These couplings are made of malleable iron in ¾- and 1-inch sizes. Dixon Valve & Coupling Co., Hancock St. and Columbia Ave., Philadelphia, Pa.

Motor Control System

A NEW proportioning control system which is attracting much interest in the rubber industry as well as other fields makes use of the device represented by the accompanying illustration. In this connection it is recognized that if temperatures are to be controlled accurately, heat must be supplied not only continuously but also graduated or modulated in direct proportion to the need of it.

Proportioning implies an equality of ratios. Consequently, if the movements of a controlled valve, for example, are graduated so that its degrees of opening are equivalent to temperature variations, the mechanical correspondence is established. This condition is effected through the medium of electrically operated units of the type pictured.

Fundamentally the system is a combination of first, a control unit such as a thermostat, expansion thermometer, humidistat, pyrometer, pressure switch, flow meter, etc.; second, a reversible electric motor with suitable gear reduction; third, an electrical balancing system which causes response of the motor in accordance with the demand of the control unit; fourth, the device such as a valve, etc., driven by the motor.

An important feature of the system is that the motor operates only when a change of position is demanded by the controller. Then the driven devices are moved immediately to a new position and remain there until conditions again change. It is claimed that this control system is conducive to the highest degree of accuracy and sensitivity and thus will make possible the production of better and more uniform products. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.

Dixon Coupling

Honeywell Proportioning Motor

Automatic Separator

Swendeman Automatic Separator

THE separator here pictured is an automatic device that eliminates oil and water from compressed air lines, and is entirely new in principle. It is not a trap but a receptacle which is vented to the atmosphere. As it precipitates the moisture, it expels it immediately, allowing the air no opportunity of picking it up again.

The principle of operation is simple. Air enters the separator at *A*, passes into the expansion chamber *B*, which has an area 9 times greater than inlet *A*; this allows the air to expand and precipitate any oil and water into the eliminator indicated at *G*. From this point it is immediately discharged through the vent *L*.

The air rises to outlet *D* through the expansion chamber *C*, which has a greater area than the chamber *B*, still further retarding the flow and giving more time for expansion and precipitation of moisture.

This separator is made in 3 styles and sufficient sizes to meet all requirements. The Leavitt Machine Co., Orange, Mass.

Machine Anchorage to Floors

THE general practice of using bolts and screws for attaching light machinery to floors is open to serious objections because the drilling of holes weakens the floor or the footings and in time the bolts work loose. Screws or bolts do not isolate machines from the floor and they serve to convey vibration and shock to the entire building.

An unique material has been devised for securely fastening machines in place which avoids drilling holes or providing expensive footings. The material used is a composition known as Pilokollan, and the method of fastening consists of melting the stock with a little water in a glue pot or double boiler to the consistency of thick cream, that is rather liquid than dense.

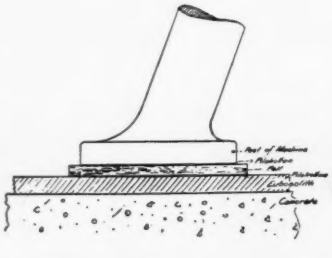
After the feet of the machine and the surface of the concrete floor have been heated by a blow-torch, the machine is set in place on felt pads that have been saturated with the melted material.

The attachment is secure after the stock has hardened under the weight of the machine for a day. Machinery fastened by this method can be easily removed by heating the footings with a blow-torch or by simply cutting the felt. United States Euboeolith Co., Inc., 45-47 N. Duke St., Lancaster, Pa.

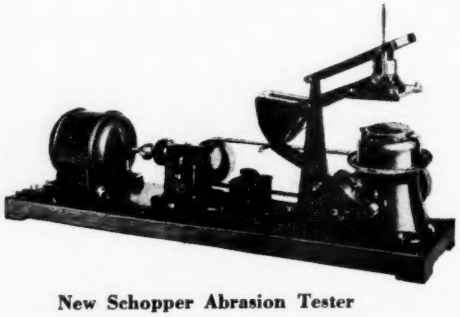
Abrasion Tester for Textile Fabrics

THE latest development in testing equipment for determining the comparative wearing qualities of all textile fabrics is pictured in the illustration. In this apparatus the fabric is subjected to abrasion in different directions and, with interruptions, on different spots so that the fibers may rise from time to time. The fabric also receives combined rotary and rolling motions whereby it is brought against a rubbing plate under a pressure which can be adjusted according to the nature of the goods under test.

The abrasion is measured not only by visual comparison but by determining the loss of weight, after a certain number of revolutions, which are indicated upon a dial. The tester is equipped with an electric motor and rheostat to maintain a constant operating speed irrespective of the load on the specimen. Testing Machines, Inc., 314-16 Broadway, New York, N. Y.

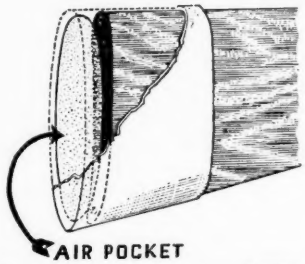


Pilokollan Machine Fastening



New Schopper Abrasion Tester

New Goods and Specialties



Air Pad for Shotguns and Rifles

Pneumatic Recoil Cushion

THE hunter or marksman who does not relish hurting his shoulders by a kicking gun will welcome the Western Pneumatic Recoil Cushion, an air pad for shotguns and rifles invented by Allan C. Hodge. It is based on the principle that air makes the perfect cushion.

Shooting with this rubber recoil pad completely eliminates the use of cheek pads, according to the manufacturer, for the gun comes straight back to the air pocket. All the recoil from the hardest kicking gun, it is said, is entirely absorbed. The air pressure within the pad is easily and quickly regulated, enabling the adjustment of the length of the user's stock to meet his own particular requirements.

The one size available in black or red rubber is interchangeable on all standard makes of shotguns or rifles. The pad, which conveniently slips over the butt of the gun, may also be used in times of emergency to bail out a boat or to give a drink to pointer or setter. Western Pneumatic Recoil Cushion Co., c/o Firestone Tire & Rubber Co., 12th and Figueroa Sts., Los Angeles, Calif.

Rubber Attachment Cap

SOFT, resilient rubber is used in the new hand-grip attachment cap by Cutler-Hammer, Inc., 309 N. 12th St., Milwaukee, Wis. The terminal blades are attached to a bakelite disk embedded in the rubber base.

Because of the nature of the rubber compound, it is stated that strain on the cord is relieved and the possibility of the cord breaking at the end of the handle is minimized. Its construction makes it unbreakable and prevents it from marring floors, furniture, and other materials of like nature.

C-H Plug

Rubber Valve Stem Tubes

THE automobile driving public is now offered an inner tube with a rubber valve stem for which many exclusive features are claimed. This rubber stem, flexible and durable, forms a water-tight seal at the rim hole and thus excludes dirt and water. The tube will not rip, nor will the stem pull out if the tire is run flat. When the tire goes flat, the flexible valve stem automatically withdraws through the rim hole to the inside of the casing; thus casing and tube slip freely on the rim and prevent pinch holes and tearing.

Watson Rubber Valve Stem

There is no metal stem to tear, chew, and puncture the rubber. The one-piece tube and stem, furthermore, prevents leakage at the valve. The tube is easily put on or taken off without tools. The manufacturer claims also that by using these tubes the car owner will reduce tube repair and replacement costs 80%. The F. H. Watson Co., Akron, O., and Little Rock, Ark.

Rubberized Fishing Trousers

DUCK hunters and trout fishermen will welcome these sporting waders, here illustrated, of 3-ply crude sheet rubber vulcanized between 2 layers of light tan duck.

The seams are reenforced and vulcanized. These waders are said to be absolutely waterproof, light, and flexible. They are equipped with draw cord and suspenders, and boast a large inside front pocket. They come in sizes 6 to 12.

Weber Waders

Particular attention has been given to the fit of these waders. Feet and ankles are snug; thus disagreeable creasing or folding is eliminated. Legs are roomy. Weber Lifelike Fly Co., Stevens Point, Wis.

Rubber Wedges

AN ENTERPRISING manufacturer now markets a wedge of molded rubber in both black and green. It is about 3 inches long by 1 inch wide and about half an inch thick at the heavier end. This device is apparently intended for use instead of the small wooden wedges which have been on the market for some years and which have successfully stopped doors and windows from swinging and rattling, made furniture set evenly on the floor, etc. It is sold by F. W. Woolworth & Co.

Golf Ball for Women

MORE and more are women playing golf. They have found golf bags and clubs especially designed for their use, but never a golf ball until the United States Rubber Co., 1790 Broadway, New York, N. Y., undertook to supply this deficiency. The result of the company's efforts is the Queen Royal, which will be a legal ball for tournament play under U. S. G. A. ball ruling, for it will measure 1.68 inches in diameter and weigh 1/10-ounce lighter than the men's standard of 1.62 ounces. Since it is lighter than the men's ball, the maker claims that Queen Royal will respond better to the hitting by a woman and will be much easier and more pleasant for the feminine player to get up in flight.

Queen Royal

Queen Royal is packed 6 balls to an attractive box, which is said to be so good-looking that many women will keep them for trinkets. The ball is available in mesh and recess marking and with colored dots or plain.

Envelope Sealer Uses Vacuum Principle

A NEW adaptation of the envelope sealer, in addition to having molded rubber feet to keep it from marring polished surfaces, employs a large red rubber collar inside the liquid container to form a vacuum suction feed moistener and seal the outlet except at the point where the water passes through. This envelope sealer is highly nickeled, and with the gay red rubber accessories and the shining glass of the bottle part makes a smart appearance on any mailing desk. Standard Mailing Machines Co., Everett, Mass.

American Rubber Executives

The brief personal sketches to be published on this page will eventually form a valuable record of the part played by American rubber executives in the progress of the industry. Presidents, vice presidents, secretaries, treasurers, sales and advertising managers, and other "key-men" are invited to send us their biographical data.

Harry J. Aitken, dist. mgr. *b.* Aug. 31, 1890, Weymouth, Mass.; public schs. and Thayer Academy, 1909; Brockway-Smith Corp., Boston, Mass., 1909-16; asst. purch. agt., Firestone T. & R. Co., 1916 to date; began as salesman, Cape Cod territory; br. mgr., Providence, R. I., 1919-31; dist. mgr., Hartford, Conn., 1931 to date. *Member:* past pres. Rotary Club of Providence, Rotary Club, Hartford, Conn. *Address:* 667-73 Connecticut Blvd., E. Hartford, Conn.

Park Akers, dist. mgr. *b.* July 13, 1890, Akron, O.; grammar and high schs., graduate, Buchtel Coll.; with Firestone T. & R. Co. for 19 yrs. in sales and managerial positions; dist. mgr., Houston, Tex. *Member:* Mason. *Address:* business, 1221-23 N. Main St.; residence, 1711 Colquitt, Houston.

Herbert A. Behre, export mgr. and asst. in domestic sales dept. *b.* May 26, 1885, New York, N. Y.; public schs., Morris High Sch., and C. C. N. Y., 2 yrs.; with export firms of G. Amsinck & Co., Inc., and W. R. Grace & Co., both of New York; export mgr. and asst. in domestic sales dept., Davol Rubber Co. *Member:* Executive Comm., Drug & Chemical Export Club of N. Y., Export Managers Club, Chamber of Commerce, Providence, R. I. *Address:* business, 69 Point St., Providence; residence, 135 Massasoit Ave., Cranston, R. I.

Harvey S. Firestone, Jr., v. pres., dir., gen. mgr. *b.* Chicago, Ill., Apr. 20, 1898; Asheville Sch., Asheville, N. C.; B.A., Princeton U., 1920; joined Firestone T. & R. Co., 1920; dir., v. pres., and mgr., Firestone Steel Products Co., rim mfr., 1922; commissioned by Harvey S. Firestone, Sr., to study rubber-growing abroad, negotiated for 1,000,000 acres on 99-year lease in Liberia and started plantations, 1926; v. pres., Firestone T. & R. Co., Akron, O., 1929, and subsidiaries, and largely instrumental in expansion of primary and allied establishments; org. Firestone One-Stop Service Stores and supervised building of plants in Brentford, Eng., and Llavallol, Argentina; pres. and dir., United States-Liberia Radio Corp. and Firestone de la Argentina; v. pres., dir., and gen. mgr., Firestone Plantations Co.; v. pres. and dir., Firestone T. & R. Co., O., Firestone T. & R. Co., W. Va., Firestone Steel Products Co., Firestone Battery Co.; dir., Firestone Plantations Co., Ltd., Eng., Firestone T. & R. Export Co., Firestone Realty Co., Firestone Park Land Co., and First Central Trust Co., Akron. *Address:* business, Firestone Works, Akron; residence, 50 Twin Oaks Rd., Akron.

Raymond J. Fries, gen. sales and adv. mgr. *b.* Aug. 26, 1876, Trenton, N. J.; public and high schs. in New York and New Rochelle, both in N. Y.; salesman N. Y. office, B. F. Goodrich Rubber Co., 1906-07; Aug., 1907, salesman, Davol Rubber Co.; opened and managed first Davol N. Y. office, May, 1910; covered eastern territory until Apr., 1917; adv. mgr. and gen. salesman, 1917-19; gen. sales and adv. mgr., 1919 to date. *Member:* Providence Chamber of Commerce, Metacomet Golf Club, E. Providence. *Address:* business, 69 Point St., Providence, R. I.

Edward James George, dist. mgr. *b.* Jan. 31, 1855, Wisconsin; public schs.; sundries and fancy goods buyer, I. A. Maxwell & Co., 1882-93; traveled for Davol Rubber Co., 1893-1918; mgr., Chicago office since 1918. *Member:* Elks. *Address:* business, 1612 Republic Bldg., Chicago, Ill.; residence, Pewaukee Lake, Wis.

Harry M. Green, dist. mgr. tire sales *b.* Sept. 4, 1894, Salt Lake City, Utah; public schs., course in general science and eng., Utah Agri. Coll.; various mines and eng. cos. in Utah, Ariz., and Idaho, 1915-17; military service, Sept., 1917-Feb., 1919; special mining rep. for Mountain States Rubber Co., Mar., 1919; supt. and purch. agt. for contracting firm, Sept., 1920; tire salesman, U. S. Rubber Co., May, 1922; mechanical salesman; mechanical sales, Rocky Mtns. mining div., 1925; mgr., Salt Lake City, Sept., 1927, retaining position with mining div.; dist. mgr. tire sales, Salt Lake City dist., June, 1929. *Member:* civic organizations. *Address:* business, 160 Motor Ave.; residence, 1366 Emerson Ave., Salt Lake City.

Carl Allan Hollinger, credit dept. *b.* July 5, 1890, Akron, O.; public schs. and business coll.; mech. div., Akron, O., and Chicago, Ill., Diamond Rubber Co.; office and traveling salesman, Whitman & Barnes Mfg. Co., Akron, 3 yrs.; Baltimore, Md., mgr., Firestone T. & R. Co., 3 yrs.; traveling auditor, export credit mgr., asst. credit mgr., Miller Rubber Co., 15 yrs.; International B. F. Goodrich Co., credit dept., since merger. *Member:* Mason, deacon in Federated Church, Barberton, O. *Address:* 532 Lloyd St., Barberton.

Burney E. Kelley, br. mgr. *b.* Hamilton, N. Y.; Colgate Academy; A. B., Colgate U., 1911; with Goodyear T. & R. Co. since 1911: clerk, Akron, O., office; Boston, Mass., br. adjuster, 1913; Indianapolis, Ind., salesman, 1914; Syracuse, N. Y., salesman until 1924; asst. br. mgr. Buffalo, N. Y., br., 1924-27; br. mgr., Syracuse br., since 1927. *Member:* Rotary Club, Syracuse, Syracuse Auto Dealers Assn. *Address:* 334 Scott Ave.

F. T. Magennis, fact. mgr. *b.* Oct. 3, 1896, Philadelphia, Pa.; went to Akron, O., in 1899; city schs. and Akron U., latter for 3 yrs., graduated from U. of Mich., B.A., 1917; saw several months' service with U. S. Army during World War; joined Goodyear T. & R. Co., Akron, and represented that company in various capacities in Central America, Colombia, Peru, Ecuador, Bolivia, Chile, British, French, and Dutch West Indies, the Guianas and Venezuela; v. pres., Goodyear T. & R. Co. of Cuba, 1928; mgr., Goodyear T. & R. Co. of South America, with headquarters at São Paulo, Brazil.

Warren Pease, Jr., mgr., mech. goods div. *b.* Mar. 30, 1894, Chicago, Ill.; grammar sch., New Trier High Sch., mech. eng. at U. of Wis.; asst. mgr., mech. goods div., Dryden Rubber Co., Chicago, Ill., 1916-25; Detroit, Mich., br. mgr., mech. goods div., Miller Rubber Products Co., 1926 to date. *Member:* Phi Kappa Sigma, Amer. Legion. *Address:* business, 7310 Woodward Ave., Detroit; residence, 1251 Buckingham Rd., Birmingham, Mich.

Everett E. Trundle, dist. mgr. *b.* Jan. 19, 1887, Washington, D. C.; grammar and high schs., 2 yrs. at coll.; asst. sec., Underhill Mfg. Co., 1905-12; dist. salesman, Maxwell Motor Co., 1914-17; br. mgr., Firestone T. & R. Co., 1917-20; salesman, Buick Motor Co., 1923-24; self-car distributer, 1920-23; real estate, Coral Gables Corp., 1924-26; with Firestone from 1926 to date as asst. sec., asst. to zone supervisor, sales closer, asst. dist. mgr., dist. mgr., Memphis, Tenn., territory. *Member:* Elks, Mason, Shriner. *Address:* business, 708 Linden St.; residence, 2167 Poplar Ave., Memphis.

Ernest P. Weckesser, sales mgr. *b.* Feb. 20, 1897, Sanborn, N. Y.; public schs., Marshallville and Doylestown, O., Williamsville Academy, Alexander Hamilton Inst., June, 1914, diploma from Business Training Corp.; Miller Rubber Co. of N. Y., 1915-30, adjuster, retail service man, mgr. service sales; mgr. auto. tire sales, asst. sales mgr., Miller Rubber Products Co.; asst. sales mgr., Hood Tire Corp., 1930-31; mgr. auto. tire and tube sales, assoc. tire lines of B. F. Goodrich Rubber Co. *Member:* Amer. Legion, Mason, Fairlawn Golf Club, at one time member of Service Mgrs. Comm., R. M. A., chairman, one year. *Address:* 238 Kenilworth Dr., Akron, O.

Rubber Industry in America

OHIO

Goodyear Activities

President Paul W. Litchfield, of The Goodyear Tire & Rubber Co., Akron, last month announced that his company has obtained the first license to manufacture rail tires[1] in the United States under Michelin French patents. The Budd-Micheline Co., Philadelphia, Pa., is now building special coaches to use these tires; and the first Goodyear tires have been shipped for installation on the new coaches, and another shipment was sent to France to be tested out over French railways.

Samuel A. Steere, manager of Goodyear's cotton and fabric division, recently received the special Litchfield medal of merit for his development of Goodyear Supertwist cord used in all the company's tires.

Carl Wollam, Goodyear free balloon pilot, won the first Litchfield award by saving the life of his aide, J. F. Cooper, in a balloon race out of Pittsburgh, Pa., when their craft was struck by lightning and caught fire.

Charles E. Brannigan, Goodyear pilot, was awarded the medal for extraordinary bravery in the line of duty.

The report for the President's Organization on Unemployment Relief discloses how the Goodyear company, among other organizations throughout the United States, has spread work among its employes by setting a maximum work week of 30 hours. When production must be increased above that point, new workers will be hired as long as there are unemployed people in the city capable of doing the work. The Goodyear plan among hourly and piecework employes has been applied so that when work diminishes, the hours of production are decreased and all employes retained on the payroll.

Goodyear officials recently entertained at the plant 2 prominent Australians now on a world tour. They are Dr. Albert C. Smith and James Kell, chairman of the board of directors of Goodyear's Australian plant and head of the Commonwealth Bank of Australia.

[1] "Michelin Pneumatic Tired Railway Coach," INDIA RUBBER WORLD, Nov. 1, 1931, p. 67, Jan. 1, 1932, p. 73; "Budd-Micheline Rail Car." *Ibid.*, Mar. 1, 1932, p. 74.

The Magnetic Gauge Co., 60 E. Bartges St., Akron, manufactures a magnetic gage for measuring continuously the thickness of advancing material while in process of manufacture. Company executives are P. B. Schuster, president; W. E. Palmer, vice president; and A. G. Ladrach, secretary-treasurer. Its eastern sales representative is Black Rock Mfg. Co., Bridgeport, Conn.

N. S. C. Ohio Meeting

The following was the scheduled program offered by the National Safety Council, Civic Opera Bldg., 20 N. Wacker Dr., Chicago, Ill., at the rubber group meeting of the All Ohio Safety Congress in Columbus last month.

Tuesday afternoon, April 19. "Safety in Foreman Training," C. C. Hantleman, Goodyear Industrial University, Akron; "Habits and Their Relation to Safety," G. L. Matthias, superintendent, Mechanical Goods Division, The B. F. Goodrich Co., Akron; "Safe Operation in a Production Dept.," D. E. Straiton, foreman, Shoe Dept., Miller Rubber Co., Inc., Akron; "Safety Kinks," film strip showing about 50 effective and novel safety devices used in the rubber industry, supplemented by detailed descriptions, B. F. Gerpheide, safety engineer, Goodyear Tire & Rubber Co., Akron.

Wednesday morning, April 20. "Cashing in on Safety through Compensation," Lawrence W. Fisher, consulting actuary, Columbus; "Creating and Maintaining Foreman and Employe Interest in Safety," A. D. Lynch, director of personnel, Ohio Brass Co., Mansfield; "Our Best Safety Stunt for 1931," 5-minute talks on practical safety ideas and their application, by R. W. Morse, Firestone Tire & Rubber Co., Akron; Mr. Gerpheide; U. L. Mohler, Inland Rubber Co., Dayton; P. M. Wooden, Mansfield Tire & Rubber Co., Mansfield; and J. Q. Lee, India Tire & Rubber Co., Mogadore.

Are Foremen Interested?

Creating interest of your foremen and supervisors in accident prevention work is not at all difficult where the conference type meetings are conducted. Many organizations have found this type of meeting an excellent place to discuss not only safety problems, but many operation troubles as well. However to assist in correlating the work of safety with your supervisor the Council has prepared a set of publications entitled, "Safety in Foremanship." More than 6,000 foremen are using these as textbooks, and as one member said, "They certainly have proved their worth." If you have not seen them, write the Council for a set and detailed information.

English-Richmond Mica Corp., Richmond, Va., a combine of the Richmond Mica Co. and the English Mica Co., has appointed The C. P. Hall Co., Akron, exclusive sales agent in the rubber industry for Silver Sheen, Silver White, and Biotite brands of mica.

Firestone Notes

At record breaking speed in a run from Miami to Jacksonville the pneumatic tired car of The Firestone Tire & Rubber Co., with Clifford D. Smith, the company's engineer in charge of tire development, at the throttle, established a precedent which traffic experts believe will have a vital bearing on the immediate future of transportation in this country. The car did the 405.7 miles in 378 minutes, elapsed time, for an average speed of 64.39 miles an hour, bettering by 42 minutes the best previous rail run between the 2 cities made over a route 40 miles shorter.

The report for the President's Organization on Unemployment Relief tells how Firestone helps its unemployed and part-time workers support their families through vegetable gardens. The company plows and prepares the soil, stakes and allots the gardens, and supplies fertilizer. Employes supply their own seeds and plants and grow whatever they desire. The past season 300 gardens were assigned, averaging approximately 80 by 80 feet in size.

Firestone Realty Co., Akron, awarded a contract for a new superservice station in Portland, Ore., to be completed before the lease on an adjoining building expires this month.

The new station, which will handle the complete Firestone line of tires and auto accessories, will be 100 by 100 feet, one story with mezzanine offices. Immediate employment was given to a considerable number of men for the construction.

L. J. Schott Co., 71 Wigley Ave., E. Akron, of which L. J. Schott is owner and general manager and H. A. Gass his assistant, handles job lots of all materials used in various phases of the rubber industry. The firm, which has been in existence about a year and a half, is in a position to buy outright from or sell for any company its surplus of raw materials of all kinds.

The Akron Bronze & Aluminum Co., 579 Washington St., Akron, manufactures brass, bronze, and aluminum castings and boot and shoe lasts. Officers include H. M. Ehmann, president; B. Ehmann, vice president; and E. Cervenka, secretary-treasurer.

Victor Rubber Corp., Springfield, manufactures automobile floor mats, running board covers, radiator hose, and mechanical rubber goods. Executives include L. C. Sturgis, president; George Cugley, vice president and treasurer; and R. F. White, secretary and purchasing agent.

Goodrich Operations

The Miller Rubber Products Co. Division, The B. F. Goodrich Co., Akron, now manufactures rubber covered milk bottle carriers. Soft rubber 1/16-inch thick, applied by the Anode process is adhered directly to the metal. Advantages claimed for this improved device are elimination of noise, protection against corrosion of metal parts, and resistance to even severest conditions. The rubber covered carrier can readily be washed and will withstand sterilization.

The President's Organization on Unemployment Relief in its report cites the Goodrich company as another rubber manufacturer spreading work among its employes. Goodrich provided work for several hundred employes previously laid off in addition to keeping on the payroll a 25 to 35% excess man power carried through 1931. Each division head arranges schedules so that each worker will have between 30 and 40 hours a week. Where departments had been working over 40 hours, a reduction was accomplished by: changing from 3, 8-hour shifts to 4, 6-hour shifts; maintaining 8-hour shifts and reducing the days worked per week; or rotation of personnel on a 5- or 6-day schedule to bring the weekly time of each employe under the 40 hours.

A recently completed survey shows that the average cost of new tires to the American motorist in 1932 is approximately 59¢ per thousand miles of road service for sizes most commonly used, according to S. B. Robertson, Goodrich vice president. This figure compares with an estimated cost of $5.67 per thousand miles which motorists paid for their use of corresponding tire sizes in 1914.

At the regular meeting of the Goodrich board of directors on April 12, in New York, N. Y., W. D. Ticknor, president of the Commercial Solvents Corp., 230 Park Ave., New York, was elected to the directorate, and Sidney J. Weinberg, of Goldman, Sachs & Co., 30 Pine St., New York, was appointed a member of the executive committee.

Last month the following employes were awarded 20-year service pins: Lloyd B. Amstutz, of the Chicago branch, who won the Master Merchandiser distinction for the last 2 years; Roy D. Mountford, manager of factory billing; Frank Quick, mechanical goods staff; Ferdinand F. Brucker, legal department; Ethel E. Farst, comptometer division; Lloyd Graffius, traffic division; George Gruber, processing division; James G. Hill, power house; Louis Moeller and Sam R. Tonks, of the tire division; Z. H. Rager and Charles Webster, of the mold division.

Art Kelly, operations engineer for the Yokohama Rubber Co., Ltd., Goodrich Japanese subsidiary, is now on a 10,000-mile return journey to the Orient after spending more than a month at the parent plant. While here at a Goodrich management dinner, he told of Japanese life and customs.

L. T. Drake, prominent in Akron tire and automotive circles for the past 12 years, has rejoined the Goodrich company sales department in Goodrich Silvertown, Inc., retail division.

Dr. A. Camillotti, engineer with the Gherzi Textile Development Co., Zurich, Switzerland, was a Goodrich visitor April 1 and 2. He is studying textile processes in large industries throughout the country.

The Akron section of the Society of Automotive Engineers will be host to the Cleveland section of the organization on May 9. The Cleveland group will lunch in Akron, visit the Goodrich plant, play golf, and be guests at dinner. Seventy-five Cleveland members will attend.

The Aetna Rubber Co., Ashtabula, through President S. T. Campbell announces that in order to serve its customers more advantageously it is arranging for warehouse space to stock its products in New Orleans, Philadelphia, Los Angeles, and Denver. Later Boston, Atlanta, and Denver also will have branch warehouse stocks. The company deems centralized manufacturing an advantage, and stocks at strategic points will make delivery overnight possible to most of its trade.

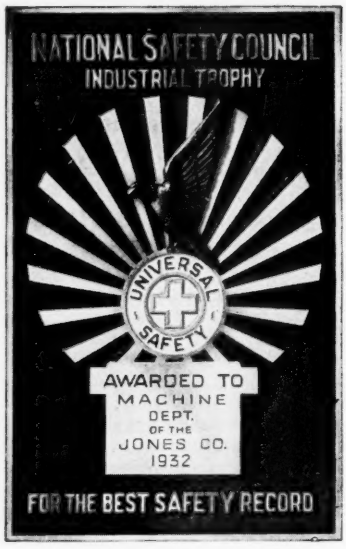
The Pioneer Rubber Co., Willard, manufactures toy balloons and rubber gloves. Officers are J. C. Gibson, president and treasurer; K. L. Milligan, vice president and secretary; and C. R. Clark, purchasing agent.

Chas. H. Longley

The Cincinnati Rubber Mfg. Co., Cincinnati, shipped what is believed to be the largest conveyer belt ever built in single length, shown in the accompanying illustration. The belt weighed 14 tons, measured 1615 feet long, and was coiled in 2 rolls, each 8-1/3 feet in diameter.

It is an 8-ply construction, 42 inches wide, of 42-ounce duck with 3/16-inch top cover, including breaker strip, and 1/16-inch bottom cover, making an overall thickness of 13/16-inch.

Trophy for Company Safety Contest



New bronze plaque, 7½ x 11½ inches, being given by National Safety Council as award for a safety contest within company

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The Globe Chemical Co., St. Bernard, Cincinnati, of which F. C. Grote is president, supplies industrial chemicals, dyes, and pigments.

E. M. Salzberg, Inc., crude rubber dealer, has moved to 605 Metropolitan Bldg., Akron. Officers are Elias M. Salzberg, president; R. E. Salzberg, vice president; and M. J. Hahn, secretary.

The Inland Mfg. Co., Dayton, manufacturer of steering wheels and other rubber automotive parts, as disclosed in a report for the President's Organization on Unemployment Relief, likewise has established maximum and minimum weekly hours to spread work. Between 24 and 32 hours a week are worked; the average is 69% of the 1929 level. By this method the number of employes has increased 25%. Employes with greatest family responsibilities and present needs are favored; while new products have been helpful to provide additional work. If output increases, the company plans to add to the number of employes rather than the number of hours.

"Compounding Latex"

In keeping abreast, as usual, with the most recent developments in rubber technology, INDIA RUBBER WORLD, beginning with the present issue, will publish **"Compounding Latex"** by Joseph Rossman, Ph.D., a series of technical abstracts from United States patents on the application of rubber latex in many diversified industries. These important articles are an exclusive feature with this magazine and can be had only by subscribing to it: $3.00 in the United States, $4.10 to Canada, $3.50 to all other countries.

EASTERN AND SOUTHERN

Binney & Smith Co., 41 E. 42nd St., New York, N. Y., has issued an appeal for the support and the cooperation of its friends and customers to assist in defeating the attempted infringement of its patents on yellow oxide by a foreign concern and thereby contribute to the return of national prosperity.

Nortz & Co., dealer in rubber futures on the New York Rubber Exchange, has moved to rooms 501-505, 82 Wall St., New York, N. Y. Telephone: HAnover 2-0353-0356.

Ernest Wiener, 55 W. 42nd St., New York, N. Y., is general sales manager in the United States for Atlantic Rubber Works, M. Steinberg, and C. Müller Rubber Works Co., all in Germany. Products handled include hospital supplies and rubber goods for all industrial and technical purposes.

Pusinelli & Poel, Inc., crude rubber importer, 347 Madison Ave., New York, N. Y., announces the following new telephone numbers: VAnderbilt 3-4360-4361.

Wood Vanderpyl Co., Inc., crude rubber broker, on April 15 moved to 11 W. 42nd St., New York, N. Y. Telephone: CHickering 4-8229.

Pennsylvania Rubber Co., Jeannette, Pa., in its recent annual report for 1931 shows an increased earning capacity in spite of lower prices. Net profits after provision for depreciation, taxes, insurance, interest, and other charges totaled $163,232. Sales gained 35% over 1930, and although cost prices for tires averaged 20% less in 1931, the dollar sale volume was 8% over the company's 1930 record. The company also announces a complete new line of tires for the 1932 market. Officers include W. O. Rutherford, president; W. A. Atkins and A. C. Bowers, vice presidents; C. G. Morrill, treasurer; and C. H. Wolfe, secretary.

George T. Bishop, president of Continental Shares Corp., Cleveland, O., and New York, N. Y., which controls the common stock of 4 of the largest rubber companies in the country, on April 5 at the Hotel Waldorf-Astoria gave a dinner to his friends. Among those present were 32 executives of the rubber industry. A second gathering was held April 12 attended only by representatives of those companies, stock of which is controlled by Continental. The proceedings of the meetings were shrouded in secrecy. According to Standard Statistics, the Continental company owns a substantial share of stock of The Firestone Tire & Rubber Co., The B. F. Goodrich Co., The Goodyear Tire & Rubber Co., and the United States Rubber Co. It holds also 800 of the 1,000 shares of Goodyear Shares, a holding company owning on April 30, last, 19.8% of the outstanding Goodyear common stock.

Paul Elbogen & Co., Inc., crude rubber broker, on April 30 moved to 450 Fourth Ave., New York, N. Y.

Blank & Stoller, Inc.

Robert Badenhop

Robert Badenhop Corp., crude rubber dealer, on April 18 moved to Suite 1930-40, Woolworth Bldg., 233 Broadway, New York, N. Y. Telephone: COrtlandt 7-6920-27. Company officers are: Robert Badenhop, president; G. LeRoy Scheinler, vice president; Murray Millenthal, treasurer; and James F. Kiernan, secretary. Mr. Badenhop, though only 49, observed the twenty-fifth anniversary of his entry into the New York rubber trade on April 22. Incidentally he had a background of 5 years' experience in the crude rubber markets of London and Hamburg prior to his arrival here. He is a director of the Rubber Exchange of New York, Inc., a member of the board of governors of The Rubber Exchange Clearing House, Inc., and a director and treasurer of the Rubber Trade Association of New York, Inc., of which he was one of the founders. Despite generally unsatisfactory economic conditions in both crude rubber and general business, his firm has enjoyed a steady and substantial increase in the field of crude rubber import.

United Carbon Co. has changed its New York, N. Y., office from 230 Park Ave. to Empire State Bldg., 350 Fifth Ave.

National Association of Waste Material Dealers, Inc., 1109 Times Bldg., New York, N. Y., has appointed W. Fred Clark manager of its traffic department. The association through this department plans to bring together for a conference on traffic matters all associates or groups in any way interested in the transportation of waste materials. The aims of this conference are to eliminate as far as possible any duplication of effort and to avoid various groups working at cross purposes with each other. All those interested are invited to write the association.

Continental Rubber Co. of New York moved its offices on May 1 from 1775 Broadway to 745 Fifth Ave., New York, N. Y.

Stauffer Chemical Co. of Texas, manufacturer and refiner of sulphur, on April 1 moved its offices from Houston to Freeport, both in Texas, to concentrate its entire operations, since its refinery is at Freeport. Orders can now be handled more quickly by the closer contact between sales, manufacturing, and shipping departments. The company maintains offices at 420 Lexington Ave., New York, N. Y.; 230 N. Michigan Ave., Chicago, Ill.; 715 Rives-Strong Bldg., Los Angeles, Calif.; 624 California St., San Francisco, Calif.; and refineries at Freeport, San Francisco, Berkeley, Calif., Bordeaux, France, and Vigo, Spain. Executives include B. P. Oliver, president; John Stauffer, vice president; R. E. Demmon, vice president and general manager; and C. Jantzen, secretary.

Mackintosh-Hemphill Co., Pittsburgh, Pa., manufacturer of steel products including rolls used by the rubber industry, through Chairman of the Board H. V. Blaxter announced the election as president of Col. James S. Ervin, who until recently had been vice president and general sales manager of H. H. Robertson Co., also in Pittsburgh.

U. S. Rubber Reclaiming Co., Inc., on April 19 moved its executive offices from 230 Park Ave. to 500 Fifth Ave., New York, N. Y. Telephone: CHickering 4-6360.

The Roessler & Hasslacher Chemical Co., Inc., held a directors meeting in New York, N. Y., on March 28, when President H. R. Carveth retired as president and director of the company and as a director of the E. I. du Pont de Nemours & Co., Inc., of which R & H is a subsidiary. Dr. M. J. Brown, vice president and a director of R & H, also resigned all positions with the company. Charles K. Davis, of New York, was then elected president and general manager. Dr. E. A. Rykenboer, formerly vice president, will be vice president and assistant general manager. Mr. Davis is well known in the chemical industry, having been president of The Viscoloid Co., another du Pont subsidiary, and has had a wide experience as a chemical engineer also with many other companies. R & H operates 3 chemical manufacturing plants. The largest is in Niagara Falls, N. Y.; the others are in Perth Amboy, N. J., and El Monte, Calif. The main sales offices are in the Empire State Bldg., New York, while branch offices are maintained in leading cities throughout the country and in Mexico. Since 1930 the company has been a du Pont subsidiary.

The Philadelphia Rubber Works Co., Akron, O., has announced the closing on April 30 of its New York, N. Y., office at 52 Vanderbilt Ave.

MIDWEST

Corduroy Rubber Co., Fuller and GT Tracks, Grand Rapids, Mich., manufactures a complete line of tires and tubes, mechanical rubber goods, and Sidewall Protection, a patented sidewall feature in the company's Triple A DeLuxe and Corduroy Universal tires. Officers are: L. A. Brown, president and general manager; R. C. Murphy, vice president; M. J. Goldner, secretary; B. T. Schall, treasurer; and M. S. Bonney, purchasing agent. They were reelected at the annual stockholders' meeting on March 15 when President Brown announced that during the past year the company added 1,300 new retail distributer accounts and that its sales volume increased despite price reductions to meet competition.

Inland Rubber Co., with main office at 146 W. 27th St., Chicago, Ill., and branch at Petroleum Sec. Bldg., Los Angeles, Calif., makes pneumatic tires and some mechanicals. Company executives include: M. J. Flynn, president; C. P. Turner, vice president; L. J. Mathy, secretary; and T. J. Hough, treasurer and purchasing agent.

Continental Car-Na-Var Corp., Brazil, Ind., manufactures treatments for all kinds of floors, including Rubber-Var and Luster-Var for rubber floors. The company maintains branches in 31 of the leading cities of the United States. Company officers are: Jas. H. Longshore, president and treasurer; Jas. M. Longshore and John L. Drelin, vice presidents; and D. E. Smalley, secretary and purchasing agent.

Anderson-Prichard Oil Corp., Oklahoma City, announces that its exclusively industrial naphtha refinery at Cyril, both of Okla., which recently suffered a serious fire, resumed full operations on March 28. The temporary lines and pumps for loading service were in operation approximately 48 hours after the fire was brought under control, even though the entire pumping system had been completely destroyed.

United States Rubber Co., Detroit, Mich., through B. J. Lemon, field engineer development division, announces the promotion of J. A. Payette to the engineer division. Mr. Payette, after graduating as Bachelor of Mechanical Engineering from the University of Detroit in 1928, entered the technical service department of the company. In 1929 he began doing field work for F. L. Krause, director of tire service department. He joined Mr. Lemon's staff March 1, 1932.

Bike Web Mfg. Co., with factory at South Bend, Ind., and main office at 2500 S. Dearborn St., Chicago, Ill., manufactures sporting goods such as athletic supporters, knee pads, and arch and elbow braces. Officers are D. E. Morrison, president; H. L. Wells, vice president; J. A. Valentine, secretary; H. P. Kendall, treasurer; and R. D. Barnes, purchasing agent.

NEW JERSEY

Some lines of the rubber industry improved considerably during the past month; while others remained unchanged. Unseasonable April weather resulted in a spurt of orders for rubber raincoat fabrics. At the hard rubber plants much improvement was noted, some due to activity in the automotive industry. Production of rubber footwear also increased and manufacture of jar rings is keeping some plants busy. Little change occurred in the output of tires and tubes.

The Thermoid Company, Trenton, on April 6 at the local Y. M. C. A. before a large gathering showed one of the most complete industrial motion talking pictures ever taken. It depicted the manufacture of brake lining, and other automotive parts and how brakes are relined and adjusted. The entire cast consisted of Thermoid employes. James A. Wheatley, sales manager of the Thermoid automotive division, has been on an extended business tour of the Pacific Coast. The company finds business good in its various departments.

I. Ely Reed, vice president and treasurer of the Mercer Rubber Co., Hamilton Square, has been elected president of the National Bank of Hamilton Square to succeed the late Dr. F. M. Arthur.

The "Micheline" pneumatic tired railroad locomotive and coach was tested recently over the Raritan River Railroad between New Brunswick and Parlin. A number of officials were guests of J. Hauvette Michelin, of New Brunswick, vice president of the Michelin Tire Co.

British Malaya

An official cable from Singapore to the Malayan Information Agency, Malaya House, 57 Charing Cross, London, S.W.1, England, gives the following figures for March, 1932:

Rubber Exports

Ocean Shipments from Singapore, Penang, Malacca, and Port Swettenham

To	March, 1932 Sheet and Crepe Rubber Tons	March, 1932 Latex Concentrated Latex and Revertex Tons
United Kingdom	5,999	79
United States	24,254	148
Continent of Europe	4,887	53
British possessions	882	1
Japan	3,388	6
Other countries	202	4
Totals	39,612	291

Rubber Imports

Actual Imports by Land and Sea

From	March, 1932 Dry Rubber Tons	March, 1932 Wet Rubber Tons
Sumatra	489	3,276
Dutch Borneo	241	1,170
Java and other Dutch Islands	56	8
Sarawak	490	11
British Borneo	100	18
Burma	199	8
Siam	110	107
French Indo-China	244	38
Other countries	87	6
Totals	2,016	4,642

The Watson-Stillman Co., Roselle, N. J., builder of hydraulic machinery and accessories, on April 1 appointed The Spalding Machinery Co., Inc., Engineering Bldg., 205 W. Wacker Dr., Chicago, Ill., to be its sales representative in the Chicago territory.

Luzerne Rubber Co., Trenton, announces that the hard rubber business has improved since last month.

C. Edward Murray, Jr., vice president of the Crescent Insulated Wire & Cable Co., Trenton, has been reelected president of the Trenton Society for Prevention of Cruelty to Animals.

Pocono Rubber Cloth Co., Trenton, recalled several employes because of increased business. Weather conditions caused a big demand for raincoat fabrics. The output of automobile topping has also increased.

Pierce-Roberts Rubber Co., Trenton, finds conditions better with increased orders for spring trade.

Joseph Stokes Rubber Co., Trenton, announces that business has shown a decided improvement at both the Trenton and Welland, Ont., Canada plants. Orders for all types of hard rubber goods have gained.

Whitehead Bros. Rubber Co., Trenton, has not felt the depression to any extent during the past winter and continues to operate on a 5-day week basis.

Woven Steel Hose & Rubber Co., Trenton, reports that business is more active than during last month. President Horace B. Tobin has been spending some time in Bermuda with his family.

Harvey S. Firestone, chairman of the board of the Firestone Tire & Rubber Co., Akron, O., recently visited Plainfield to take an extended ride on the new Firestone low pressure balloon tires. He stopped there en route to Princeton where his sons, Raymond and Roger, attend the university. He also drove to Newark to visit Charles Edison, son of the late Thomas A. Edison. Mr. Firestone said he believed the low pressure tires would be adopted by several car manufacturers.

Thiokol Corp., Yardville, through President and General Manager Bevis Longstreth has announced that H. R. Ferguson, M. I. T., '24, formerly associated with Raybestos-Manhattan, Inc., Manhattan Rubber Mfg. Division, Passaic, joined its staff on April 1. Other Thiokol officers are Jos. C. Patrick, vice president and technical director, and Frank Kovacs, vice president and development manager.

Maxwell Rubber Products Corp., 181 Verona Ave., Newark, numbers among its products Tamby Toys, solid rubber playthings in colors for children, infants' rubber specialties, and general molded rubber goods. Officers are Maxwell M. Kahn, president and purchasing agent, and William B. Feldstein, secretary-treasurer.

PACIFIC COAST

According to State Labor Commissioner T. A. Reardon of California, manufacturers of tires and other rubber products employing over 60% of the wage earners in their lines had 2,390 at work in March, or 13.1% fewer than in the same month in 1931; had a weekly pay-roll of $49,932, or 33.5% less than in March, 1931; and workers' weekly earnings averaged $20.89, or 23.5% less than in March, 1931.

The many branches of the rubber trade were well represented with exhibits at the fifth annual industrial exposition in March of the Purchasing Agents' Association of Los Angeles, Calif., in the latter city. At a banquet given to honor members of the Sales Managers' Association and officials of the Los Angeles Chamber of Commerce the principal address was given by the president of the latter body, A. Schleicher, who is also head of the Samson Division, United States Rubber Co., Los Angeles.

Los Angeles Group, Rubber Division, American Chemical Society, held another golf tournament April 23 at the Baldwin Hills golf course under the direction of the group committee, C. L. Remy, T. E. Pittenger, and A. L. Pickard, chairman, the trophy being a fine silver handicap cup. An impromptu dinner followed.

Farrel-Birmingham Co., Ansonia, Conn., has recently been adding to the mechanical equipment of the Firestone Tire & Rubber Co., Samson Division of United States Rubber Co., Pacific Hard Rubber Co., and several paper making concerns in Los Angeles, Calif. The Pacific Coast representative is P. C. Parkerton.

W. K. Thompson has moved his crude rubber brokerage business from 228 W. 2nd St., Los Angeles, to 5153 Earl Drive, La Canada, Calif.

President N. S. Dodge of the American Rubber Mfg. Co., San Francisco, Calif., was a mid-March visitor in Los Angeles.

Goodyear Tire & Rubber Co. of California (Los Angeles) reports to stockholders that net sales for 1931 were $15,078,637, a reduction of 25% compared with 1930. Total earnings from operations were $247,935 before interest and reserve for commitments, but after providing $970,616 for depreciation of plant and equipment. Reserve for loss on commitments in the amount of $204,215 had been provided against shrinkage in value of raw materials purchased for future delivery. Net operations for the year, after all charges, including the reserve mentioned, resulted in a profit of $25,529. Surplus at the close of the year was $2,588,897 after payment of current dividends on preferred stock amounting to $559,699. Funded debt in the original amount of $5,000,000 representing 5-year 5½% sinking fund gold notes due February 15, 1931, was retired at maturity.

The company found business last month much better than in March, and orders are steadily increasing for the new "Airwheel" or doughnut type tires. The plant is now making numerous tires of this sort in sizes 6.60 by 16, 7.50 by 16, and 9.00 by 13 and is rapidly providing for the production of such tires for 16 of the more widely sold types of car. An aggressive advertising campaign on the Pacific Coast is said to have greatly stimulated the demand for the plump casings.

Paul W. Litchfield, president of the Goodyear Tire & Rubber Co., Akron, O., was a mid-March visitor in Los Angeles, Calif. He stated that the Navy dirigible *Akron* would visit the Pacific Coast about May 1 and that the *Macon*, its sister ship, was already half built.

While in Los Angeles Mr. Litchfield was reelected chairman of the board of directors with these associates: President John W. Mapel, Vice President and General Superintendent L. Tomkinson, Treasurer J. S. Willaman, Secretary-Comptroller H. J. Young, Sales Manager J. K. Hough, R. S. Wilson, Clifton Slusser, and J. E. Jardine.

United States Rubber Co. notes a general improvement in trade conditions on the Pacific Coast and excellent prospects for sales of its numerous products during the next couple of months at least. Pacific Coast Tire Sales Manager J. B. Magee, who has been making a business tour through the Northwest, reports that a long spell of wet weather has troubled tire distributers from all sections, but as stocks are at a low level and weather conditions are getting much better, a more cheerful spirit is shown. At the factory in Los Angeles, Calif., known as the Samson Division, tire production has been holding up well and for May a particularly large production ticket is being planned. Recent visitors from the main plant at Detroit, Mich., were Jos. Shaughnessy, general manager of the tire division, and E. L. Bryant, assistant general manager in charge of production.

A. Schleicher, head of the Samson Division, and now president of the Los Angeles Chamber of Commerce, has with the concurrence of the latter body made a strong appeal to manufacturers to adopt the 5-day-a-week plan in order to give the utmost distribution of employment.

Griffith Rubber Mills, 22nd and Nicolai Sts., Portland, Ore., finds a steadily increasing demand for rubber-covered printing rolls and is said to be serving in this way practically all the leading newspapers of the Northwest. It is reported that the old composition rolls are rapidly becoming obsolete, so much more efficient have rubber rolls of the proper compound proved under the most exacting tests. The mills also make hard rubber doctor blades, cork-fiber-rubber non-slip pulleys, and many specialties for the pulp and paper industries. There has been no recent change in the company's official personnel.

United Rubber Corp., San Francisco, Calif., has moved its plant to Los Angeles, Calif., where the company is now consolidated with the Pacific Hard Rubber Co., the plant of which is at 3215 E. 26th St., in the Vernon manufacturing section, and the main office is located in the Rives-Strong Bldg., Los Angeles, adjoining those of the Stauffer Chemical Co., which has a major interest in both rubber companies. The local plant, which is credited with being the most completely equipped battery concern west of Akron, O., is now in production and in a position to give complete hard and standard rubber container service, including tops, bushings, vents, etc. Warehouse stocks will be kept in San Francisco and at other points on the Pacific Coast where consumption will warrant such keeping. The president of the Pacific company is John Stauffer, Jr.; vice president and general manager, Herbert King; secretary and treasurer, Wm. C. King; and general sales manager, Walton R. Smith.

Cascade Rubber Co., 35 W. Lander St., Seattle, Wash., which, according to Secretary H. P. Pratt, went into receivership in January of this year, may not be reorganized, contrary to a report to that effect. The concern has been operating for several years in recovering paper mill rolls and in making matting and other rubber goods, but had been seriously affected by the general trade let-down. S. P. Barash was president.

Firestone Tire & Rubber Co., Los Angeles, Calif., had as a recent visitor President E. W. BeSaw of the Firestone Tire & Rubber Co. of Canada, Ltd., Hamilton, Ont., Canada. He reports February business as exceptionally good in the Dominion and tire prospects very encouraging there as well as in the United States. At the Los Angeles plant tire production is being steadily stepped up; so the output for May, it is said, will be exceptionally large.

President C. C. Gates, of the Gates Rubber Co., Denver, Colo., recently arrived on the Pacific Coast after making a tour of the world with Mrs. Gates and two daughters. The trip included visits to the chief rubber producing areas in South America and the Far East.

Pacific Goodrich Rubber Co., Los Angeles, Calif., reports seasonal production as excellent. Orders for tires in the 11 far western states and trans-Pacific territory increase steadily. A special gain has been many new dealers in the Southwest. The company is going into production strongly on the new doughnut casings, or Goodrich "Super-Cushions," as the tires are called. Special attention will be given to the smaller car sizes.

Ever Ready Products Co., 12th and Howard Sts., San Francisco, Calif., ac-

cording to President M. E. Dorman, finds business good for its many types of sheeted and made-up products, including dress shields, sanitary goods, infants' wear, aprons, and other rubber merchandise. The one branch which it maintained in Los Angeles has been discontinued. The official personnel, besides the president, includes T. L. Dorman and M. E. Sherman.

W. B. Cruyton Tire & Rubber Co., 1122 - 38th St., Los Angeles, Calif., of which W. B. Guyton is head, distributes Lee tires in southern California and Arizona.

Converse Rubber Co., 392 Pearl St., Malden, Mass., manufactures rubber and canvas footwear of all kinds, including Skoots tennis shoes, Chix Fashional footwear, All Star basketball shoes, Caboose rubbers, and Rod and Reel fishing boots. Executives are: Albert H. Wechsler, president; Clinton E. Little, vice president; Meyer Orlov, secretary; F. R. Allen, treasurer; and Robert C. Kelley, purchasing agent.

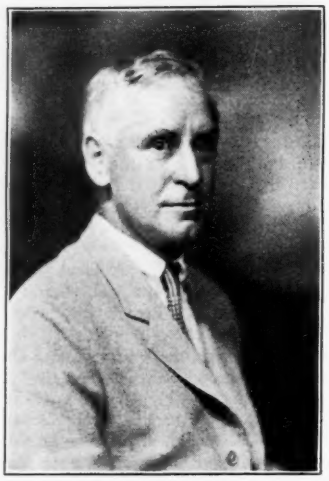
Colvulc Rubber Co., 11 Fayette St., Norfolk Downs, Boston, Mass., supplies plastic and liquid rubber. The company maintains branches at 605 W. Washington Blvd., Chicago, Ill.; 51 Terminal Way, Pittsburgh, Pa.; 72 Cortlandt St., New York, N. Y.; 1420 Woodward, Royal Oak, Mich.; and 1135 Mission St., San Francisco, Calif. Officers of the company are Edw. H. Best, president and treasurer; P. N. Sylvester, vice president and purchasing agent; and Stewart Woodworth, secretary.

Curtis & Marble Machine Co., manufacturer of finishing machinery for all kinds of fabrics, Worcester, Mass., has added to its staff Robert E. Steere, of Pawtucket, R. I., to act as general representative devoting much of his time to New England territory. Mr. Steere has had previous experience with Lorraine Mfg. Co., Nashawena Mills, and Manville Co.

United States Rubber Co., in line with its policy calling for consolidating manufacturing units, is moving its Mechanical Development and Engraving Departments, Footwear Division, to Naugatuck from New Haven, both in Conn. It is understood that owing to the closing of various footwear plants in the East which were identified with the United States Rubber Co. system, a centralized development department would serve the interests of the company to greater advantage if located nearer to the divisional headquarters in Naugatuck. About 50 employes will be affected by this closing of the New Haven laboratories.

C. F. Church Mfg. Co., Holyoke, with its molding division at Monson, both in Mass., manufactures Sani-Black Seats, black molded hard rubber toilet seats, and rubber tank balls. Officers are Otto Kolstad, president; Richard A. Witherell, treasurer and general manager; and D. E. Warner, purchasing agent.

NEW ENGLAND



F. H. Banbury

Banbury's Western Trip

F. H. Banbury, manager of the Banbury Mixer Department of Farrel-Birmingham Company, Inc., Ansonia, Conn., recently returned from a 10-week trip to the Pacific Coast, with visits to his company's customers in the Midwest and Far West. While at Los Angeles he visited all the rubber companies in that district with the Farrel-Birmingham Los Angeles representative, H. F. Parkerton. At the February meeting of the Los Angeles Rubber Division of the A. C. S. Mr. Banbury delivered an address on "Banbury Mixers."

A week at Smoke-Tree Ranch near Palm Springs gave him some of the vacation which was the primary purpose of the trip. Palm Springs is the winter home of Henry C. Pearson, former owner of INDIA RUBBER WORLD. Although retired, Mr. Pearson is still interested in rubber, and Mr. Banbury spent a pleasant afternoon with him discussing past and present conditions in the industry.

After calling on the San Francisco trade with the Farrel-Birmingham representative, George L. Hurst, Mr. Banbury returned to Riverside for another week's vacation at Mission Inn before returning home. On the return journey several days were spent at the Gates Rubber Co., Denver, and other calls were made at Cincinnati and Erie.

Many New England companies have been turning to new products as a stimulus to business according to a recent survey by the New England Council. Its questionnaire brought 853 replies. New products were reported as a source of increased earnings during 1932 by 419 or 48%. Further inquiries elicited 105 answers. Of these 65 described new products now on the market, 14 new products in the research stage, and 8 new products in the process of manufacture. Among the answers of interest to the rubber trade are: Appleton Rubber Co., Franklin, Mass., golf tee mats of green rubber compound as substitutes for grass tees; Seamless Rubber Co., New Haven, Conn., "Electró-sheet," washable body-conforming, easily regulated heating pad; A. C. Gilbert Co., New Haven, special sets for making toy rubber balloons. Merrimac Chemical Co., Boston, Mass., nitrocellulose lacquer developments in which lacquer is used for decorative papers; lacquers for rubberized fabrics.

Firestone Tire & Rubber Co. held a meeting last month at its offices, 1414 Brookline Ave., Boston, Mass., attended by more than 200 New England Firestone tire dealers. M. F. O'Neil, merchandising manager of the company at Akron, O., was the principal speaker. The gathering heard that 6,800 dealers joined the Firestone organization in 1930 and over 8,700 during 1931.

Blu-J Golf Ball Co. recently opened at 429 Washington St., Boston, Mass., employing 4.

The Car Dealers Tire Outlet, 1237 Hyde Park Ave., Hyde Park, Mass., has been taken over by Thomas Randazzo, of that city.

The Hastings Rubber Floor Co. established an office at 660 Huntington Ave., Boston, Mass. M. S. Phillips is in charge.

The Quabaug Rubber Co., North Brookfield, opened a new office at 216 Tremont St., Boston, both in Mass. This company has successfully manufactured rubber tile for the past 10 years and is now introducing a new and improved line of Armortred Trackless and Armortred Sof-Tone rubber flooring.

Irving B. Moore will not be connected with the Boston Belting & Rubber Co., 222 Summer St., Boston, Mass., in any way in the future. Fred J. Heggerty will handle the firm's business.

Riggs & Lombard, a new firm of textile wet finishing equipment manufacturers, has taken floor space in the Lawrence Mfg. Co.'s mills at Lawrence, Mass., where it will manufacture various types of machinery, among them rubber and metal rolls. The executives include H. C. Riggs, C. J. Lombard, and B. H. Lock.

Stowe-Woodward, Inc., Newton Upper Falls, Mass., includes among its rubber products bowling, cue, and billiard balls, billiard table cushions, rollers, deckle straps, and the Adams densimeter.

National Rubber Co., 29 Lincoln St., Boston, Mass., handles rubber heels, taps, soles, and strips. Harry M. Jacobs is purchasing agent.

Rubber Mills Outlet Corp., 208 Essex St., Boston., Mass., contracts for seconds and discontinued numbers from several rubber mills making soles and heels, and its brands include Flash, Baloon, Archer, Columbia, and Spartan. Company officers are E. Weiss, president and treasurer; B. Bernhard, secretary; and Henry Weiss, purchasing agent.

OBITUARY

J. G. Muirheid

JOSEPH G. MUIRHEID, 64, formerly of Trenton, N. J., and long active in the rubber industry, was instantly killed March 24 by a falling elevator in an unoccupied plant in Charlotte, N. C., which he and his companion were inspecting with a view to leasing it for manufacturing rubber accessories. For many years Mr. Muirheid had been head of the tire department of the Thermoid Rubber Co., Trenton. He went to Charlotte 15 years ago to join the J. & D. Tire Co. Later he became service manager of the McClaren Rubber Co., also of Charlotte.

Surviving are his widow, a daughter, and a son. Interment was in the Pennington, N. J., cemetery.

Tire Executive

ON MARCH 31, following a lingering illness, Francis G. Harrison, 44, chairman of the board of the Harrison Tire & Rubber Co., died at Christ Hospital, Cincinnati, O. For many years he had been president of the tire company, which he organized 19 years ago. He belonged to the Carmargo Country and the Queen City clubs.

Mr. Harrison is survived by his widow and a daughter.

H. W. Wegmiller

HERBERT W. WEGMILLER, 47, foreman in the maintenance and construction department of the Miller Rubber Products Co., Inc., Akron, O., and a Miller employe for 20 years, died at his home April 5 after an illness with intestinal trouble. He was born in Akron on November 29, 1884, and lived there all his life.

Besides his wife he left 2 daughters, his parents, a sister, and 2 brothers.

Mr. Wegmiller was a member of the Swiss Club of Akron and the Christian Science Church.

Veteran Rubber Man

BRONCHIAL pneumonia led to the death on April 3 of Tod Joseph Mell, of Melflex Products Co., Akron, O., manufacturer of safety treads, mats, and pads, and molded rubber goods. The deceased had devoted his entire business career to the rubber industry.

He was born in Akron on October 2, 1875, and was educated in the local elementary and high schools. In 1894 he secured a position as office boy and order clerk with the Diamond Rubber Co. From 1896 to 1905 Mr. Mell served The B. F. Goodrich Co. in its store room and repair and tire departments. He then joined the Republic Rubber Co. and remained with it until 1916 as manager of its tire department doing experimental engineering. That year he went to Wabash, Ind., to become general manager of the Perfection Tire & Rubber Co. In 1918, he returned to Akron

Tod J. Mell

as assistant superintendent of Plant 2, Firestone Tire & Rubber Co. Then in 1922 he rejoined the Goodrich company as consulting engineer. The Aetna Rubber Co., Ashtabula, O., won his services in 1927 when it began manufacturing rubber flooring. In 1929, however, Mr. Mell returned to his native city and developed the Melflex safety tread.

He was the inventor of many patents on tire construction, rims, repair equipment, rubber mill machinery, and process of rubber goods manufacture. He belonged to the Masonic bodies and the Fifty-Year Club.

Funeral services were held on April 5 and burial was in Glendale Cemetery. Surviving are his widow, a daughter, and 2 brothers.

J. F. McGuire

JOHN FRANCIS McGUIRE for 12 years with The B. F. Goodrich Co., Akron, and later president of the Republic Rubber Co., Youngstown, both in O., died at his home on Prince St., West Newton, Mass., last month. He retired from active business in 1911 and since then made his home in West Newton, with a summer home at Sugar Hill, N. H., where he had extensive charitable interests. He is survived by his wife and 2 daughters. Funeral and interment were at Newton.

A. W. Anthony

ANDREW W. ANTHONY, Harvard '09, and formerly associated with the United States Rubber Co., Bristol, R. I., recently died at his home in Brookline, Mass. He came of distinguished ancestry, being a direct descendant of George Weeks, who came here in 1636, of Col. Daniel Pierce, of Newbury, and of Elder William Brewster, Myles Standish, John Alden, Governor Thomas Dudley, and others well known in Puritan history.

Canadian Manager

JOHN A. CONNOR, 59, manager of the Dominion Rubber Co., Ltd., Toronto, Ont., and prominent lawn bowler, recently died at his home, Parkside Dr., Toronto. He had been ailing for some time, having suffered a stroke in California about a year ago. Born in London, Ont., he had resided in Toronto since 1914.

Former Superintendent

A SERIOUS heart condition which had incapacitated him for 3 years caused the death on March 20 at Chicago, Ill., of Frank D. Batchelder. He had been superintendent of the power plant of The Fisk Tire Co. for about 5 years up to 1920. He held the same position with the Murray Rubber Co., Trenton, N. J., from 1920 to 1926. Later he joined L. Albert & Son, Trenton, buying and selling rubber machinery for the firm.

Surviving are Mrs. Batchelder and her sons.

Crude Rubber Man

TWENTY-FIVE years ago W. H. Hildreth, who died in London, England, on April 1, was a prominent figure in the crude rubber trade. He was born in 1864 at Charlestown, Mass., and at an early age became a junior clerk with Geo. A. Alden & Co., Boston, Mass., the largest importer of crude rubber in the United States. For a number of years he was in the employ of A. Stein in New York and went to Bahia, Brazil, as manager of the firm's business.

In 1904 Mr. Hildreth became identified with A. H. Alden & Co., Ltd., crude rubber importer, London, and was manager of its business in Manaos for a number of years. Later he was transferred to London as managing director.

When Alden's Successors, Ltd., was formed in 1914 to take over the A. H. Alden & Co., Ltd., and the Adelbert H. Alden Co., of Para and Manaos, he became a managing director of the new concern. His retirement followed a few years later and he had since lived in London.

In February, 1922, Mr. Hildreth was appointed a member of the Committee of the Rubber Trade Association of London, and was elected vice chairman in the following year, becoming chairman in 1924.

His genial personality will be greatly missed in the trade. In prosperous times as well as when business was poor, he always had a cheery word for everyone and was universally popular and well liked.

Thomas P. Moran, formerly with the Boston Rubber Shoe Co., Malden, Mass., recently died at his home there.

John H. O'Brien, 73, for 30 years employed by the Boston Rubber Shoe Co., Malden, Mass., having spent practically all his life in the rubber shoe making business, recently died at his home in Malden.

CANADA

The budget brought down this month incorporates many changes. The sales tax has been increased from 4 to 6%, and the special excise tax on all goods imported into Canada has been increased from one to 3%. According to wholesalers and importers this increase in the excise tax acts as a blanket increase in tariff of 2% on all imported merchandise. Together with the higher sales tax and the present exchange situation, they believe this may further limit the purchases of merchandise from outside the Dominion. Prices will be increased on imports, and revisions are being put through on items now affected.

Rubber manufacturers are revising their trade discounts from list prices on mechanical rubber goods. No change is being made in garden hose, the additional sales tax being absorbed.

Manufacturers and wholesalers state that garden hose orders recently have been heavy as dealers took in their initial stock for the summer season. The price of hose this year is much below last year's quotations, which in turn were lower than 1930 prices. Some makers describe present prices as the lowest in the history of the industry.

The sale of rubber household mats is becoming heavier as spring cleaning brings a demand for this equipment. These mats, available in a wide variety of hues to harmonize with kitchen and bathroom color schemes, are being prominently displayed by the trade.

Raincoat manufacturers anticipate a rainy spring. One manufacturer, at least, is showing novelty tweeds. Sport styles are highlighted in current collections, with the polo coat of gaberdine being most popular.

The present is supposed to be the season for placing orders for rubber footwear, but the general report is that as there is no early order discount this year, dealers are in no hurry to make commitments.

Rubber Association of Canada at its annual meeting in Toronto on April 7 elected the following officers for the ensuing year: president, F. A. Eric Warren, president and general manager, Gutta Percha & Rubber, Ltd., Toronto; vice president, E. P. Sargeant, vice president and general manager of the Goodrich Rubber Co. of Canada, Ltd., Kitchener; treasurer, H. C. Jeffries, president, Viceroy Rubber Co., Ltd., West Toronto; assistant treasurer, C. A. Jones, general manager, Seiberling Rubber Co. of Canada, Ltd., Toronto; secretary and manager, Arthur B. Hannay.

Bauer & Black, Ltd., Toronto, Ont., manufacturer of supporters and other elastic sports equipment, just brought out among new articles the Lastex Sweat Sox, a feature of which is the built in elastic supporter for ankle and arch. The toe and the heel of a Lastex stocking are of an unusually durable silk and lisle non-elastic material.

Ashley & Crippen

Frederic Alden Warren

New President of Gutta Percha & Rubber, Ltd.

The new president of Gutta Percha & Rubber, Ltd., is rather young in years but his long manifested outstanding ability has won for him this high position. Frederic Alden Warren has been associated with the company that he now heads since January 2, 1919, when he entered the factory. Two years later he was transferred to the head office and the next year was made a director. In 1925 he became treasurer and this year was elected also president and general manager.

Mr. Warren was born in Toronto on December 2, 1897. When the boy grew older, he attended Upper Canada College, Toronto, and Royal Military College, Kingston.

Many organizations are proud to list him a member, including Canadian Manufacturers' Assn., Rubber Assn. of Canada, of which he was recently elected president, Toronto Board of Trade, York, National, Toronto Golf, Royal Canadian Yacht, Badminton & Racquet, and Toronto Cricket clubs, Art Gallery of Toronto, University Club of Toronto, Royal Canadian Institute, and Toronto Lawn Tennis Club, Ltd.

This enterprising executive may be reached at the company's offices, W. Lodge Ave., Toronto 3.

Ontario Rubber Co., Ltd., Toronto, Ont., has reduced its capital stock from $40,000 to $15,000.

Jos. Maton, of the Miner Rubber Co., Ltd., Granby, P. Q., was recently elected secretary of the Granby Branch of the Quebec Division of the Canadian Manufacturers' Association.

Gutta Percha & Rubber, Ltd., Toronto, Ont., is featuring a spring advertising campaign, the largest it has ever put out, and includes newspaper and billboard advertising and dealer helps.

Canadian Goodrich, Ltd., Kitchener, Ont. The Montreal branch now occupies 730 Notre Dame St. W., a 3-story building entirely remodeled to suit the firm's requirements as warehouse and offices. Situated in the heart of the business district, it has 2 large handsome show windows which are always attractively dressed, featuring displays of the various lines of manufacture, such as rubber footwear, tires, etc.

Goodyear Tire & Rubber Co. of Canada, Ltd., New Toronto, Ont. Three hundred and fifty guests attended the annual staff At Home in the auditorium, Lake Shore Rd. An evening of jollity prevailed with euchre, bridge, and dancing featured. E. A. Harris was general chairman assisted by W. C. Curry, O. H. Barrett, C. E. Shumaker, T. H. Terrill, and their committees. Advertising Manager C. H. Watson recently addressed the monthly meeting of the Advertising Club of Hamilton, Ont., on direct mail advertising. His talk tied up with the Direct Mail Exhibit on display at the Club. President and General Manager C. H. Carlisle, recently was married to Mrs. May H. Ansley, of Thomasville, Georgia, U. S. A. The couple spent their honeymoon in Georgia. J. R. Coe, of the Goodyear organization at Vancouver, B. C., recently was elected a member of the Vancouver Board of Trade.

Thrift Tire Co., Ltd., Montreal, P. Q., has been granted a provincial charter with a capital stock of $50,000.

National Rubber Machinery Co. of Canada, Ltd., Toronto, Ont., was recently incorporated with a capitalization of $50,000.

Commercial Tires, Ltd., Montreal, P. Q., distributer of Firestone tires, moved into more spacious quarters at 638 Dorchester St. W.

Federal Rubber Products, Stratford, Ont., assisted by the exchange conditions, has begun manufacturing force cups, hose washers, rubber tubing, and sponge rubber. The company has been making basin and bath plugs for some time but found it very difficult to meet American competition aided by mass production, until the exchange added to the duty helped the Federal company, which now manufactures a fairly large proportion of these articles used in Canada. A similar condition existed in regard to pump and valve leathers, and the firm notices new business since the exchange, added to the duty, has shut out a part, at least, of the American articles.

El Popo Co., Mexico City, Mexico, has installed considerable additional machinery and plans to add more in its plant. When the equipment is completely installed, it is reported that the company will be able to produce 1,500 inner tubes and 300 casings daily.

Rubber Industry in Europe

GREAT BRITAIN

New Inventions from Waste Rubber

The large amounts of waste rubber that can now be so cheaply obtained have apparently stimulated inventiveness. Thus a patent has been applied for lino rubber which is made from ground vulcanized rubber and intended for use as soundproof coverings for floors and walls. The basic material, which may be new or old vulcanized rubber, is ground to the consistency of fine flour. It is mixed with boiled linseed oil or other binder, spread on a canvas backing, and calendered. It is claimed that the particles of vulcanized rubber retain their natural elasticity, do not absorb the binding agent, or merge into or become an ingredient of it as is the case with plastic rubber; consequently lino rubber is claimed to have a maximum sound-deadening power.

By spreading cork linoleum mixture on top of the vulcanized rubber linoleum mixture, a double linoleum is obtained combining the advantages of the cork tread surface with the resilience and sound-deadening properties of the rubber base.

The inventor also proposes to surface roads with vulcanized rubber scrap dissolved in tar, bitumen, and oil residue bitumen. This product, he claims, gives a much stronger and less brittle surface than is to be had with pitch and oil residue bitumen.

Another paving material employs finely ground vulcanized rubber combined with bitumen emulsion in constructing tennis courts, for surfacing garden paths, drives, bowling greens, etc. The composition requires about 12 lbs. of pulverized waste rubber per square yard and is applied in a semi-liquid state. It can be obtained in various colors and gives a surface that is not only waterproof and resilient, but also jointless.

Japanese Competition

The North British Rubber Co. completely closed down its rubber footwear department at Fountainbridge, Edinburgh, Scotland, for 2 weeks beginning March 16, thus affecting 2,000 employes. The immediate cause for this measure is the flood of rubber footwear from Japan sold at prices with which it is impossible to compete in the United Kingdom. The drop in sterling upon the departure from the gold standard in September resulted in a spurt of activity for the North British footwear department, as under the altered circumstances many continental and American competitors were no longer able to send goods to England. Within the last few months, however, Japan, which is also off the gold standard, poured into the country more goods than was formerly sent by all the foreign houses combined, and in addition ousted British concerns from many export markets.

On the Continent it appears that the extent of the Japanese menace is fully recognized and prohibitive tariffs are being levied as a means of protection. But in England so far little has been done, although for some months efforts have been made to get the Board of Trade to make an order in respect of footwear under the Abnormal Imports Act; for the present 10% general tariff is inadequate. However, an application has been made to the new Tariff Committee for an increased duty.

India Tire & Rubber Co.

A special circular issued to stockholders of the India Tire & Rubber Co. (Great Britain), Ltd., states that at the instance of the Prudential Assurance Co., the largest shareholder, a full investigation of the company's affairs by independent accountants was begun. The accounts for the year to December 31, 1931, show a considerable loss largely due to adjustments applicable to previous periods in regard to stocks of finished products which were stated in the balance sheet at December 31, 1930, at a figure greatly exceeding cost, and to losses on forward contracts for large quantities of raw materials.

Since it was felt necessary to have a whole time chairman, H. A. Holmes was appointed, replacing W. P. Naismith, who resigned the chairmanship but is still on the board of directors. A. M. Melville, director and managing director, resigned, and R. C. Thorne takes his place as director. Thorough reorganization of all branches of the company's activities is now in progress. The immediate financial requirements have been taken care of by the Prudential Assurance Co.

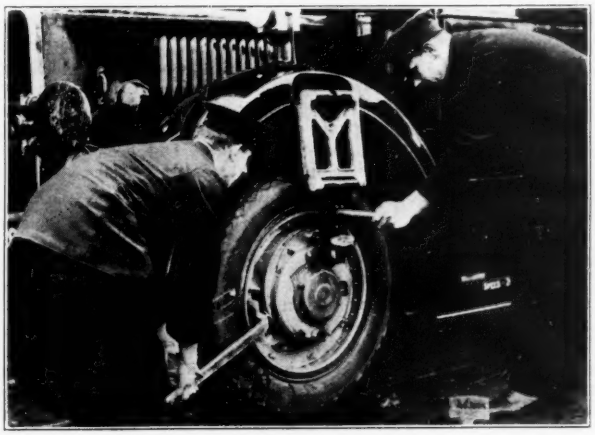
Novel Store Front

One of the several stores run by Davis & Son, dyers, of London, has been fitted with a unique front. Instead of the usual expanse of plate glass set in masonry, the shop has a front of grey rubber with aluminum trim broken by 3 small round windows on the style of port holes. A fourth round hole is set in the door. It is said that the Davis concern plans to introduce this type of front for all its stores.

The Ro-Railer

The interest in the Michelines has evidently stirred the London Midland and Scottish Railway to unwonted enterprise. First it ran the Micheline experimentally between Oxford and Bletchley for something like 7 weeks and now, it is learned through *Motor Transport*, this company has applied to the West Midland Traffic Commissioner for permission for a road service license to cover the experimental operation of a road service with the Ro-Railer between Stratford-on-Avon station and the Welcome Hotel at Stratford.

Details concerning the Ro-Railer were rather widely published about a year ago.[1] This vehicle has pneumatic tired wheels combined with steel flanged wheels so arranged that the car can quickly be adapted for travel either on rails or on the road. It seems that in the meantime the Ro-Railer has been improved so that vehicles of this type may eventually be regularly run.



Changing a Ro-Railer Wheel

Subway Exhibition

In the Charing Cross Underground Station a series of small exhibitions have been held of late, and recently the Rubber Growers' Association opened up a most attractive rubber display called "A Glimpse of the Rubber Industry." The location is an excellent choice, for thousands

[1] India Rubber World, Mar., 1931, p. 89.

of persons must pass the exhibit during the day and are inevitably drawn to examine the dining-room and bathroom which have been fitted up to illustrate uses of rubber in the home, or to watch the demonstrations of latex dipping and electro-deposition, vulcanizing, or the repair of crepe-soled footwear. Incidentally, a Micheline pneumatic tired railway wheel was shown for the first time in England at this exposition.

Rubber Slide Fasteners

The Swish Rapid Rubber Fastener, according to *Rubber Age*, of London, is manufactured of specially compounded rubber which is sufficiently resilient to allow the engaging edges to interlock and yet is so tough that the individual T pieces forming the connecting links instantly recover their normal position after the slide has passed over them for opening or closing the joint. These fasteners can be made in any length and of any color desired. Since they are entirely of rubber, they cannot rust, nor are they affected by atmospheric changes. To render the closure perfectly air-tight and moisture-proof, a strip of rubber or proofed material may be laid underneath. It is obvious that the possibilities for a closing of this type are limitless. The inventors of the ingenious device are C. Crawford and T. B. Powell.

British Notes

An Order in Council requiring that imported adhesive insulating tape for electrical purposes shall bear an indication of origin on sale or exposure for sale in the United Kingdom, becomes effective June 17, 1932.

Harry Symington, of Symington & Wilson, has been elected chairman of the Rubber Trade Association of London for the year, March, 1932, to March, 1933. This is the second time Mr. Symington holds this office; the first was from March, 1925, to March, 1926.

The Lysaght Protected Steel Co., Ltd., Orb Iron Works, Newport, Monmouth, South Wales, was recently registered with a nominal capital of £20,000 in £1 shares. The firm is to exploit an exclusive license granted by the Dunlop Rubber Co., Ltd., for protecting metal surfaces in accordance with a patent which the latter concern holds and another which is pending, and besides is to engage, among other things, in manufacturing rubber and insulated and acid resisting articles.

The Ioco Rubber & Waterproofing Co., Ltd., Glasgow, Scotland, a subsidiary of Vickers, Ltd., has obtained a contract to cover with rubber flooring the entire floor space of the electricity show rooms being erected in Glasgow by the Glasgow Corp. The building has 6 floors, and the total amount of rubber flooring required will be over 4,500 square yards.

Sir George Beharrell, managing director of the Dunlop Rubber Co., Ltd., has been nominated president of the Federation of British Industries for the coming year.

The value of 1931 British exports of rubber manufactures was £6,450,570 ($31,388,474 at par of exchange), as compared with £8,338,613 ($40,575,691) for 1930, a decrease of 22.6%.

GERMANY

Leipzig Spring Fair

It was not expected that the Leipzig Spring Fair this year would be very well attended or that much business would be done; consequently no one was really disappointed. In fact considering present business conditions, there was more activity than expected. Despite the difficulties laid in the way of export trade by various nations, a satisfactory number of foreign visitors were present who seemed to be particularly interested in specialties and novelties; so in these lines a fair amount of business was done. Several English buyers placed orders for specialties. This action was of particular interest since trade between England and Germany has been greatly reduced by the new high duties levied on imports in England.

In the rubber goods section most attention was paid to rubber garments, particularly aprons; rubber novelties also proved of interest as also did bathing slippers. However not much was done with seamless goods, household and surgical rubber, or toys and bathing caps.

The different firms represented at the Fair had comparatively little to show that was actually new. Flugel & Polter, Leipzig, displayed crepe rubber quoits. The Gummiwarenfabrik Saul, G. m. b. H., Aachen, also showed rubber rings of this type besides featuring a toy football that looked like the regulation football. This ball has been produced to offset competition from cheap balls made in Japan.

C. Muller Gummiwarenfabrik A.G., Berlin-Weissensee, had a new mattress intended for aquatic sports, the main feature of which is lightness and incompressibility. Other firms represented were the Continental Gummi-Werke A.G., Hannover, which exhibited general rubber articles and sporting goods; the New York-Hamburger Gummi-Waren Co., Hamburg, showed a full line of hard rubber goods; Zieger & Wiegand A.G., Leipzig, and Vulkan Gummi-Warenfabrik Weiss & Baessler A.G., Leipzig, displayed toys and novelties; Veritas Gummiwerke A.G., Berlin-Lichterfelde, featured well-made gaiters that can easily be buttoned on over rubber shoes, besides an advertising ball shaped like a Zeppelin.

Companies in 1931

A review of the German stock companies in the rubber and asbestos industries at the end of 1931 showed 48 concerns with a combined capital of 107,000,000 marks, while at the end of 1930 there had been 47 with a combined capital of 104,000,000 marks. Last year one new company, capitalized at 1,000,000 marks, was formed and one went into liquidation, while in 1930 one company with a capital of less than a million marks failed.

Other changes during 1931 are mentioned. Thus Michelin A.G. raised its capital 4,000,000 marks, and the Pepege Deutsche Gummiwerke A.G., in Marienburg, 1,000,000 marks. On the other hand the Mannheimer Gummi-Guttapercha & Asbestfabrik A.G., Mannheim, reduced its capital 1,100,000 marks and then increased it 400,000 marks at the same time changing its name to Mannheimer Gummifabrik A.G. The Asbest- & Gummi-Werke Alfred Calmon A.G., Hamburg, reduced its capital 1,640,000 marks.

Of the 48 concerns one had a capital of 10,000 marks; 3 were capitalized at 50,000 marks, 12 over 100,000 marks, 9 over 500,000 marks, 19 over 1,000,000, 3 over 5,000,000, and one, 40,000,000 marks.

All Rubber Tire

A tire built entirely of rubber has been patented by the Hessische Gummi-waren-Fabrik Fritz Peter A.G., Klein-Auheim, near Hanau. For the casing 2 separate mixings are first prepared, alike in all respects except that different accelerators are used in each for better vulcanizing effect when the mixings are combined. For example these mixings would be made up of 9,300 gr. of rubber, 550 of zinc white, 950 of mineral rubber asphalt, 375 stearic acid, 8,400 gas black, 50 selenium, 400 sulphur. One, however, would contain in addition 125 gr. of benzo-thiazyldisulphide, and the other 125 gr. of diphenyl-guanidine. The high gas black content as well as the selenium give the cover stock its comparatively inelastic quality.

The casing is made from both mixings combined, and upon it is placed the tread strip. The whole is then vulcanized in the usual tire press for 10 minutes at 90 pounds' steam pressure. The finished cover may be used with the customary inner tube.

Transparent Vulcanized Rubber

It is known that rubber mixings containing factice, when vulcanized cold, produce semi-opaque rather than transparent products. However, if not more than 2% of zinc oxide calculated on the crude rubber content is added to factice and rubber mixings containing accelerators, sulphur, and transparent fillers, such as powdered glass, ground quartz, or mica, highly transparent vulcanizates are produced.

Italy

Net profits of the Societa Italiana Pirelli over the past business year were 22,300,000 lire instead of 27,500,000 the year before. The dividend was reduced from 12 to 10%. The Compagnie Internationale Pirelli in Brussels, Belgium, has also reduced its dividend to 15%.

Yugoslavia

A shoe factory is to be erected in Vukovar by Tomas Bata, the well-known Czechoslovakian manufacturer, who plans to produce rubber footwear and other rubber articles, perhaps even tires, in addition to leather shoes.

Rumors are also current to the effect that Bata intends to erect a similar factory in France between Nancy and Strasburg. It seems that 48, 5-story buildings of 80 by 20 m. are to be constructed and that employment will be given to 20,000 workers.

Rubber Industry in Far East

MALAYA

Malayan vs. Dutch Producer

Last month it was stated in these columns that Malayan planters on the whole no longer were interested in restriction. In the meantime restriction negotiations have definitely ceased, and interest now centers on the probable action to be taken by producers since they know that they must find a way out of the rubber muddle on their own initiative.

The *Malayan Tin and Rubber Journal*, which has long preached a rubber war between Malayan and Dutch producers, points out some of the advantages that the former have over the latter, which will give Malaya the victory. First comes the depreciation of sterling; then Malaya has a very peaceful population which is not likely to trouble the authorities; and most of the rubber is within easy reach of railways to nearby ports.

On the other hand much of the rubber grown in the Dutch East Indies and certainly all in the Outer Possessions, says the paper, is not within easy reach of transport facilities. It might further be added that because of the indentured labor system in Sumatra many concerns are unable to take full advantage of present low labor rates; while Malaya is free to the extent that Chinese labor can be substituted for Tamil which under present conditions many planters find more expensive and less efficient than the former.

These are no mean advantages. It has been sought further to improve the position of the local planter as compared with that of his Dutch rival by asking the government to reduce estate rents. A commission had been appointed to consider taxation in the rubber industry and had recommended the remission of all rents over $1 (Straits currency) per acre which would have resulted in a saving of from 0.22- to 0.66-cent per pound in production costs to estates now paying more than $1 per acre. The government rejected this proposal; nevertheless rumors are afloat that some reduction in rents may be made after all, but not on the scale suggested by the committee. On the face of it planters stand to gain comparatively little by a decision to remit part of the rents, but in these days when prices are calculated in fractions of cents, a little less here and there makes quite a difference in the end.

Now the query is will the Malayan planter make use of his relatively stronger position to tap to the limit in order to crowd out his Dutch rival, or will the weaker companies who have held on in hopes of restriction drop out and leave the more fortunate companies to pursue the methods best suited to individual conditions. One thing is certain, whatever the attitude here may be toward the Dutch, producers feel that their chief business for the present is to please the American consumers.

As the *Malayan Tin and Rubber Journal* puts it: "Let us of Malaya be the first to give them exactly what they require. A customer gained is a customer never lost if his interests are studied by the seller."

Pretty Rubber

Apropos of the interests of consumers, there has been much discussion of late in local papers on the type of rubber preferred by manufacturers. What really started this talk was an article in the local press calling attention to the fact that European estate rubber was losing favor with manufacturers who preferred the remilled native product because it is easier to work and much more uniform than estate rubber. It was pointed out that while estate rubber was comparatively more costly to prepare, the difference in price paid for it and for native rubber was surprisingly small.

Years ago O. De Vries, returning from America, reported to Dutch rubber producers that American manufacturers needed fine quality rubber for only a limited number of purposes and that an average, clean, uniform product was all that was required for the bulk of goods made. It was his suggestion that central factories be erected to prepare the cheaper grade of rubber.

Nor have there been lacking voices in Malaya protesting against the folly of pretty rubber, and such have been strengthened in their opinion by the article on processing estate rubber by George H. Carnahan,[1] and more recently by a speech by L. Cresson, chief chemist and manager of the Singapore Rubber Works, Ltd., at a meeting at Kuala Lumpur. He suggested cooperation between planters and manufacturers. At least 3 different types of rubber should be produced having such physical properties that would entirely meet with the manufacturers' approval. By research, planters would be able to produce types with definitely constant physical properties and thus would gain the confidence of manufacturers; consequently producers would be able gradually to oust native rubber since the natives by their primitive methods would be unable to prepare rubber with constant definite qualities.

[1] "Processing Estate Rubber," India Rubber World, Dec., 1931, pp. 49-51.

Incidentally it is worth noting that the Acting Colonial Secretary of the Straits Settlements, who is returning to England via America, has been asked by the governor, Sir Cecil Clementi, to stop at New York to get in contact with American consumers.

Less Crepe Rubber

No discussion of the favored qualities of rubber would be complete without mentioning that there is a decrease in the production of fine pale crepe. This decrease is due to the fact that the preparation of crepe is costly, and today when economy is the watch word, more companies are concentrating on sheet which requires much less working. Because of the relative scarcity of crepe, this type commands a substantial premium over sheet; nevertheless this is not sufficient to make up for the difference between the costs of producing the 2 types of rubber, and one continues to read of estates who are taking up sheet in preference to crepe. Thus the Glenealy Rubber Plantations states in its annual report that although hitherto the bulk of estate production was fine pale crepe which commands a premium over sheet, because of the high costs of crepe and because the machinery upkeep is costly, the question of installing machinery for preparing sheet is being considered. The cost for this work is reasonable and, it is hoped, will greatly reduce manufacturing costs.

Malayan Notes

The Sussex Rubber Estate, belonging to the North Perak Rubber Estates, Ltd., and situated in Lower Perak, was sold at auction for $5,500 to E. E. Moreau. The estate, comprising 1,068 acres, for the year ended July, 1930, obtained a crop of 149,908 pounds. There has been no tapping on the estate since December, 1930. The buyer, in addition to the $5,500, also has to pay $10,482.50 representing quit rent due for 1930, 1931, and 1932. Even so, the price works out at less than $16 (Straits currency) per acre.

Lunas Rubber Estates, Ltd., booked a profit of $476 over the past year's working. Clearing and replanting of 25 acres of old rubber were undertaken to ascertain whether further old areas on the estate could profitably be replanted, when it is planned to cut out old rubber and replant with selected high yielding strains. The company has sold 60 tons of ribbed smoked sheet for delivery 5 tons per month during 1932 at 10 1/8¢ per pound. No other forward sales have been made.

NETHERLANDS EAST INDIES

Restriction Views

Hope of restriction has at last had to be definitely given up. As to why restriction negotiations failed, opinions differ. In some British circles it is claimed that the Dutch were not serious in their overtures, that too much was made of the difficulty offered by native rubber; in others it is hinted that the Dutch were too weak to go through with a restriction program. Certain Dutch authorities on their part believe that British rubber interests did not adopt a particularly tactful attitude toward the Dutch and showed no willingness to cooperate, particularly when the drop in sterling improved their position as compared with that of the Dutch. On the other hand it is asserted in Java that the fact that Mr. Luytjes was sent to Holland made the failure of restriction plans a foregone conclusion, for he is greatly interested in native rubber; and it is rather maliciously insinuated he would like nothing so much as to see the European industry make place for a wholly native rubber industry. Probably all are partly right, and all a little wrong.

Now what is going to happen? A writer in the *Telegraaf* thinks that the very weak companies will soon have to give up as, without any chance of restriction, they can not obtain any more credit. The result will be reduced output, not enough to restore the balance between production and consumption, but just enough to cause prices to rise to what the writer terms "the fatal level," that is a price that by reducing the loss per pound, for it will not be high enough to cover average costs, will enable many companies to continue to produce until they too will have to give up the struggle. The best thing, says the writer, would be for these companies to conserve their resources by going on a care and maintenance basis until prices are more remunerative.

Various companies are taking more or less drastic action to meet the present situation. It is reported that the Rubber Cultuur Mij., Amsterdam, plans to convert 1,000 hectares, or about 2,470 acres, of its rubber estate, Liberta, to oil palms.

The Kali Kempit estate, in the Banjoewangi division, will reduce tapping 50%; while the Djatirono, Djamboe, and Kali Bendo Estates, also in the same section, will cease tapping entirely.

A cable from Soerabaia reads that the firm of Ross Taylor has notified all estate employes that after July, 1932, their services will no longer be required. Of the 41 estates managed by this concern 8 will be closed down, and very probably this course will be adopted in the case of 3 more. In addition, restriction averaging 50% will be introduced on 9 other estates. Measures regarding the remaining estates are still under consideration.

A press report from Batavia announces that since the beginning of the year about 10,000 bouws of rubber, that is about 17,540 acres, have been abandoned. This area would have yielded 2,500 to 3,000 tons of prepared rubber for the year.

Area Out of Tapping

The Netherlands East Indies Statistical Bureau announces that 161 rubber estates with an area of 24,531 hectares had stopped tapping on the entire area by the end of January, and that 114 estates with an area of 14,968 hectares had stopped tapping on part of their area. Thus 60,592 acres were entirely out of production, and an additional 36,971 acres were affected to some extent. (These figures do not appear to be directly comparable with those reported in our Circular 3198, representing areas out of tapping November 25, 1931, the grand total of which (107,563 acres) was slightly higher than the above. Whether the areas noted above represent total acreage, or productive acreage, is not stated in advices to the United States Rubber Division.

Country of Origin Required of Imported Rubber

By Treasury Decision 45,442, issued February 11, 1932, and effective 90 days thereafter, the country of origin is required to be shown in connection with all articles imported into the United States, including crude rubber. The notation of country of origin should be distinct, and if packages contain confusing notations of country names, the words "product of" should precede the country of origin. Shippers of rubber to this country are required to show country of origin to the best of their knowledge, bearing in mind that "country of origin" is the country of original manufacture or production. Rubber produced in the Federated Malay States, Unfederated Malay States, or Straits Settlements could show merely "British Malaya" as country of origin, or the particular district could be shown.

CEYLON

Rubber Diseases

On the great majority of estates in the main low-country districts the most dangerous disease is *Fomes lignosus*, says R. K. S. Murray in his review of rubber diseases in Ceylon in 1931. To prevent the spread of this fungus the most thorough measures should be taken, such as removing all diseased roots and infected material; otherwise large areas may become involved, making the control of the disease exceedingly difficult and costly. *Ustulina Zonata* is almost as important on mature areas, and, as it develops very rapidly, adequate attention should be paid roots, collars, and stems.

During the Southwest Monsoon bark rot was rather severe in many districts. Dieback of main twigs and branches was prevalent on poor washed-out soils. Dying back is often most marked on estates which 2 or 3 years ago carried out intensive manuring programs on soils deficient in humus but which under present slump conditions cannot continue this work. Deprived of the manure, the soil has reverted to its former condition of relative sterility and, consequently, can no longer support the additional foliage produced by the application of the manure. Hence the dying back which, Mr. Murray points out, will continue until the quantity of foliage is no longer out of proportion to the nourishment the roots can supply from the poor soil; unless a virulent parasite meantime gains entrance when the matter will be much more serious. To stop dieback regular manuring must be resumed, in addition to establishing cover crops and silt pits, which action, of course, is out of the question for most estates at present.

Prolonged wet weather was responsible for comparatively severe secondary leaf fall due to *Phytophthora Palmivora* in most districts, and the cessation of manuring and other measures of cultivation may result in more than usual damage from this disease during the next few years. *Oidium* leaf disease is firmly established in all districts, and in mid-country elevations defoliation was serious. Experiments conducted in Matale reveal that both yield and bark renewal are seriously affected by intensive attacks over a number of years, but a sufficient degree of control can be secured by sulphur dusting to maintain yield at a normal level.

Young budded rubber is subject to a variety of diseases. Considerable damage due to *Phytophthora Palmivora* is reported, and some clones appear particularly susceptible to this disease.

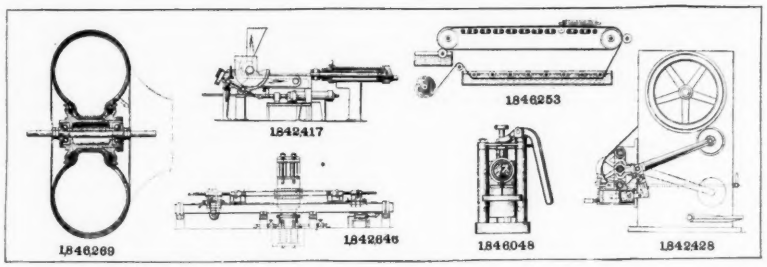
Green manures, used to improve soil conditions on rubber estates, are themselves subject to a host of diseases. Mr. Murray reports that *Sclerotium Rolfsii* was found attacking varieties of Crotalaria, a green manure used on an estate in the Kalutara district, and rapidly killing the plants.

From a study of the above reports the following points emerge: that all estates have a variety of diseases to cope with but that those with poor soil, that is low-yielding areas, are more subject to disease than others; that these poor estates to economize have had to abandon soil improving measures; consequently disease has become more severe on these estates and is expected to increase in severity in the next few years; that green manures, used to improve soil conditions, themselves need to be treated for disease, involving further costs.

Do these facts not indicate, for one thing, that a permanent shakeout of poor estates is due because they are handicapped on all sides?

But good estates and budded areas are also subject to a variety of diseases, all requiring immediate and costly attention. Fighting *Oidium* by sulphur dusting, for instance, has been figured to cost around 9 rupees per acre and would involve a tidy sum annually where a thousand acres or so must be regularly treated. It would appear that the European rubber industry has a graver problem to solve than competition from native rubber and that the question of overhauling the entire planting system is of more importance than the problems of rubber preparation.

Patents, Trade Marks, Designs



Machinery

United States

1,842,417.* **Mold Stuffing Machine.** This is designed for filling molds under all conditions of the stock employed. It combines also a device for leveling off the material in the molds after they have been relieved of the stuffing pressure. C. B. Matz, Akron, O.

1,842,428.* **Tire Band Machine.** In this device an improved means is provided for positively feeding rollers or stitcher wheels over the tire form to compact the components of the tire band upon each other. The travel of the stitchers at the limit of their outward feeding movement is automatically reversed. F. J. Shook, assignor to National Rubber Machinery Co., both of Akron, O.

1,842,646.* **Vulcanizing Apparatus.** This vulcanizer is designed for curing articles under tension such as belting. Its chief objects are to assure uniformity of structure and stretch in endless belts, to save time and labor in their vulcanization, and to tension all parts of the belt equally. V. E. Atkins, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

1,846,048.* **Testing Machine.** This tester is designed for determining the density, resiliency, and permanent set of plastic materials, particularly rubber compounds. Provision is made for maintaining a fixed pressure on the test samples regardless of how much the latter is depressed. Also the weight or pressure applying member is practically full floating, thus compensating for any torsional stresses in the sample. C. H. Desautels, Springfield, assignor to Fisk Rubber Co., Chicopee Falls, both in Mass.

1,846,253.* **Rubber Thread Machine.** This apparatus is designed to provide an improved rubber thread of uniform circular cross section and with a smooth, knot-free surface. The thread is produced in a continuous manner by depositing a continuous layer of rubber on a traveling surface and progressively rolling the layer upon itself from one side to the other of a circular form. The layer thus is wound into helical convolutions. J. R. Gammeter, Akron, O.

1,846,269.* **Tire and Wheel.** This combination of balloon tire and wheel is especially adapted for use on airplanes. The object of the invention is to provide a tire which will give a much greater cushioning effect than those heretofore used so that an airplane may land on a very rough surface without unduly straining its frame. A. J. Musselman, Chicago, Ill., assignor to Goodyear Tire & Rubber Co., Akron, O.

*Pictured in group illustration.

18,394. (Reissue.) **Tire Building Tool.** N. L. Warner, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

1,847,349. **Airbag Inserter.** H. F. Maranville, assignor to General Tire & Rubber Co., both of Akron, O.

1,847,408. **Tire Vulcanizer.** G. J. Mead, Milwaukee, Wis., assignor to Fisk Rubber Co., Chicopee Falls, Mass.

1,847,772. **Tire Spreader.** E. F. Larson, Gotham, Wis.

1,848,684. **Tire Supporting Structure.** H. J. Woock, Lodi, Calif., assignor to Super Mold Corp., Reno, Nev.

1,848,961. **Balloon Tire Inspection.** R. E. Manley, assignor to Manley Mfg. Co., both of York, Pa.

1,849,034. **Tire Spreader.** J. J. Dettling, assignor to General Tire & Rubber Co., both of Akron, O.

1,849,055. **Compressibility Tester and Grader.** T. Cropper, Erdington, assignor to Dunlop Rubber Co., Ltd., London, both in England.

1,849,138. **Tire Manufacturing Device.** H. A. Denmire, assignor to General Tire & Rubber Co., both of Akron, O.

1,849,139. **Tire Pressure Indicator.** H. A. Denmire, assignor to General Tire & Rubber Co., both of Akron, O.

1,849,229. **Bead Plate.** L. O. Grange, assignor to W. J. Jarratt, both of Chicago, Ill.

1,849,291 and 1,849,292. **Material Plasticating Machine.** W. A. Gordon, Shelton, assignor to Farrel-Birmingham Co., Inc., Ansonia, both in Conn.

1,849,571. **Hard Rubber Article Mold.** I. Q. Gurnee, Butler, and W. Hopper, Bloomingdale, assignors to Superior Hard Rubber Co., Butler, all in N. J.

1,849,617. **Multiply Material Assembler.** F. E. Ensley, assignor to Goodyear Tire & Rubber Co., both of Akron, O.

1,849,828. **Vulcanizer.** J. R. Gammeter, Akron, O.

1,849,916. **Mandrel Joint.** P. C. Dutton, Nutley, N. J., and E. Hazell, New York, N. Y., assignors to Morgan & Wright, Detroit, Mich.

1,849,928. **Rubber Mill Strip Cutter.** T. B. Huestis, assignor to National India Rubber Co., both of Bristol, R. I.

1,849,938. **Cementing Machine.** H. F. Lewis, Hamden, assignor, by mesne assignments, to Goodyear's India Rubber Glove Mfg. Co., Naugatuck, both in Conn.

1,850,053. **Tire Rimmer.** H. D. Stevens, assignor to Firestone Tire & Rubber Co., both of Akron, O.

1,850,055. **Centering Device.** S. R. Tayman, assignor to Firestone Tire & Rubber Co., both of Akron, O.

1,850,056. **Material Abrasion Tester.** F. D. Abbott, assignor to Firestone Tire & Rubber Co., both of Akron, O.

1,850,061. **Rubberized Fabric Stock Apparatus.** R. R. Jones, assignor to Firestone Tire & Rubber Co., both of Akron, O.

1,850,062. **Strip Former and Coverer.** N. H. Myers and F. Goodall, assignors to Firestone Tire & Rubber Co., all of Akron, O.

1,850,097. **Trimming Machine.** S. J. Finn, Beverly, Mass., assignor to United Shoe Machinery Corp., Paterson, N. J.

1,850,223. **Tire Tester.** M. Castricum, Springfield, assignor to Fisk Rubber Co., Chicopee Falls, both in Mass.

1,850,238. **Tire Casing Painter.** C. E. Maynard, Northampton, assignor to Fisk Rubber Co., Chicopee Falls, both in Mass.

1,850,409. **Bead Coating Machine.** M. C. Meyer, assignor to Joseph H. Meyer Bros., both of Brooklyn, N. Y.

1,850,450. **Rubber Mixing Mill.** H. A. Denmire, assignor to General Tire & Rubber Co., both of Akron, O.

1,850,706. **Seam Reenforcer.** A. E. Collins, Cuyahoga Falls, O., assignor, by mesne assignments, to Miller Rubber Co., Inc., Wilmington, Del.

1,850,708. **Sewing Machine.** H. L. Davis, Walpole, Mass., assignor to B. F. Goodrich Co., New York, N. Y.

Dominion of Canada

320,256. **Footwear Machine.** Hood Rubber Co., Inc., Wilmington, Del., assignee of Hood Rubber Co., assignee of A. A. Glidden and T. M. Knowland, all of Watertown, and L. H. Burnham, Lexington, co-inventors, all in Mass., U. S. A.

320,378. **Tire Expander and Bagging Mechanism.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of W. L. Pipes, Elizabeth, N. J., U. S. A.

320,380. **Tire Mold.** Dunlop Tire & Rubber Goods Co., Ltd., Toronto, Ont., assignee of H. Willshaw and T. Norcross, co-inventors, both of Birmingham, England.

320,564. **Tire Casing Core Remover.** Dunlop Rubber Co., Ltd., London, assignee of H. Willshaw and L. S. Blanchard, co-inventors, both of Birmingham, all in England.

320,575. **Tire Mold.** Goodyear Tire & Rubber Co., assignee of R. C. Bateman, both of Akron, O., U. S. A.

320,578. **Pickless Fabric Inspection Device.** Goodyear Tire & Rubber Co., assignee of R. D. Evans, both of Akron, O., U. S. A.

320,664. **Inner Tube Tester.** F. B. Brower and S. P. Hansen, co-inventors, both of Toronto, Ont.
320,807. **Golf Ball Winder.** Dunlop Tire & Rubber Corp., Buffalo, assignee of C. S. McChesney, Kenmore, both in N. Y., U. S. A.
320,896. **Wire Coating Device.** Western Electric Co., Inc., New York, N. Y., assignee of T. K. Cox, Chicago, Ill., both in the U. S. A.

United Kingdom

361,465. **Golf Ball Molding Apparatus.** Dunlop Rubber Co., Ltd., London, H. Willshaw and W. A. Cowles, both of Dunlop Rubber Co., Ft. Dunlop.
361,550. **Vulcanizer.** O. Schmidt, Greifenstein-on-Donau, Austria.
361,999. **Fabric Impregnating Device.** J. H. Fenner & Co., Ltd., and J. H. Fenner, both of Hull.
362,274. **Tire Molding Device.** Goodyear Tire & Rubber Co., Akron, O., U. S. A.
362,289. **Vulcanizing Press.** E. Siempelkamp, Krefeld, Germany.
362,531. **Plastic Substance Air Remover.** Dunlop Rubber Co., Ltd., London, and H. Smith, of Dunlop Rubber Co., Ft. Dunlop.
362,898. **Golf Ball Thread Winder.** R. H. Hazeltine, New York, N. Y., U. S. A.

Germany

546,475. **Inner Tube Vulcanizer.** Gillette Rubber Co., Eau Claire, Wis., U. S. A. Represented by B. Kugelmann, Berlin.
546,921. **Making Insulating Bands.** Allgemeine Elektricitats Ges., Berlin.
547,140. **Ground Waste Press.** Guillumet & Co., Ltd., Barcelona, Spain. Represented by A. Zehnden, Berlin.
547,578. **Making Soles.** H. C. L. Dunker, Helsingborg, Sweden. Represented by E. Wesnigk, Berlin.
547,579. **Shoe Vulcanizer.** Hood Rubber Co., Inc., Wilmington, Del., U. S. A. Represented by B. Kugelmann, Berlin.

Designs

1,208,955. **Hot Curing Dipped Goods.** J. Fromm, Berlin-Kopenick.

Process

United States

1,847,574. **Marking Articles.** C. W. Sigel, Akron, O.
1,847,975. **Shoe Making.** P. L. O'Donnell, Norwood, O.
1,848,164. **Dipped Goods.** J. R. Gammeter, Akron, O.
1,849,598. **Printing Plate.** J. T. and G. A. Simms, assignors, by mesne assignments, to B. R. Herring, all of Chicago, Ill.
1,849,625. **Tire Building.** R. E. Jenkinson, assignor to Goodyear Tire & Rubber Co., both of Akron, O.

Dominion of Canada

319,960. **Rubber Layer Joint.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of W. G. Christopherson, Grosse Pointe Park, Mich., U. S. A.
320,385. **Boot.** B. F. Goodrich Co., New York, N. Y., assignee of L. H. Burnham, Lexington, Mass., both in the U. S. A.
320,805. **Uniform High Grade Rubber.** De Laval Separator Co., New York, assignee of A. E. Flowers, Poughkeepsie, both in N. Y., U. S. A.
320,814. **Treating Gas Cell Fabric.** Goodyear Tire & Rubber Co., assignee of W. C. Calvert, both of Akron, O., U. S. A.

United Kingdom

361,954. **Photomechanical Printing Cylinder.** Rotophot A. G. Für Graphische Industrie, Berlin, Germany.
361,983. **Molding Footwear.** H. C. L. Dunker, Helsingborg, Sweden.
362,894. **Top Boot.** Soc. Industrielle Des Téléphones, Paris, France.

Germany

546,820. **Elastic and Non-elastic Corset Parts.** Firma Ernst Max Helbig, Dresden.
547,185. **Vulcanizer.** Hydraulik G. m. b. H., Duisburg.

Chemical

United States

1,847,599. **Reclaiming Rubber.** R. A. Dunham, Long Beach, assignor to Union Oil Co. of Calif., Los Angeles, both in Calif.
1,847,600. **Plasticizing Rubber.** R. A. Dunham, Long Beach, assignor to Union Oil Co. of Calif., Los Angeles, both in Calif.
1,847,601. **Reclaiming Rubber.** R. A. Dunham, Long Beach, and M. T. Flaxman, assignors to Union Oil Co. of Calif., both of Los Angeles, all in Calif.
1,847,641. **Rubber Composition.** A. B. Cowdery, Needham, Mass., assignor to Barrett Co., New York, N. Y.
1,847,974. **Age Resister.** H. A. Morton, Akron, O.
1,848,721. **Age Resister.** M. H. Hubacher, Nitro, W. Va., assignor to Rubber Service Laboratories Co., Akron, O.
1,848,946. **Activating Carbon.** A. Godel, assignor to Societe de Recherches et d'Exploitations Petroliferes, both of Paris, France.
1,849,354. **Dusting Powder.** R. E. Lester, Brooklyn, assignor to H. C. Bugbird, New York, both in N. Y.
1,849,489. **Rubber Treatment.** L. H. Howland, Passaic, N. J., assignor to Naugatuck Chemical Co., Naugatuck, Conn.
1,849,822. **Antioxidant.** A. M. Clifford, assignor to Goodyear Tire & Rubber Co., both of Akron, O.
1,850,135 and 1,850,136. **Accelerator.** D. H. Powers, Penns Grove, N. J., assignor to E. I. du Pont de Nemours & Co., Wilmington, Del.
1,850,716. **Accelerator.** H. Gray, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

Dominion of Canada

319,932. **Compounding Ingredient.** Barrett Co., New York, N. Y., assignee of A. B. Cowdery, Needham, Mass., both in the U. S. A.
319,959. **Accelerator.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of S. M. Cadwell, Leonia, N. J., U. S. A.
320,020. **Insulating Adhesive.** Western Electric Co., Inc., New York, N. Y., assignee of A. R. Kemp, Westwood, N. J., both in the U. S. A.
320,327. **Vulcanized Rubber Product.** W. B. Wiegand, Sound Beach, Conn., U. S. A.
320,377. **Age Resister.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of C. Coleman, Passaic, N. J., U. S. A.
320,462. **Inner Tube Filler.** H. French and W. F. Welbeloved, co-inventors, both of Toronto, Ont.
320,565. **Synthetic Rubber.** I. G. Farbenindustrie A. G., Frankfurt a. M., assignee of W. Bock and E. Tschunkur, co-inventors, both of Köln-Mülheim, all in Germany.
320,574. **Antioxidant.** Goodyear Tire & Rubber Co., assignee of L. B. Sebrell and A. M. Clifford, co-inventors, all of Akron, O., U. S. A.
320,576. **Age Resister.** Goodyear Tire & Rubber Co., assignee of A. M. Clifford, both of Akron, O., U. S. A.

United Kingdom

361,466. **Age Resister.** Imperial Chemical Industries, Ltd., London.
361,628. **Rubber Composition.** Dunlop Rubber Co., Ltd., London, D. F. Twiss and S. G. Ball, both of Ft. Dunlop.
362,034. **Adhesive Composition.** J. Y. Johnson, London. (I. G. Farbenindustrie A. G., Frankfurt a. M., Germany.)
362,049 and 362,136. **Rubber Composition.** W. W. Triggs, London. (Felten & Guilleaume Carlswerk A. G., Cologne, Germany.)
362,172. **Antioxidant.** Goodyear Tire & Rubber Co., Akron, O., U. S. A.
362,481. **Plasticizing Age Resister.** British Celanese, Ltd., and W. H. Moss, both of London.
362,862. **Mixed Accelerator.** Rubber Service Laboratories Co., Akron, O., assignee of W. Scott, Nitro, W. Va., both in the U. S. A.
362,907. **Antioxidant.** Rubber Service Laboratories Co., Akron, O., assignee of W. Scott, Nitro, W. Va., both in the U. S. A.
363,348. **Synthetic Rubber.** J. Y. Johnson, London. (I. G. Farbenindustrie A. G., Frankfurt a. M., Germany.)
363,644. **Mixed Accelerator.** Rubber Service Laboratories Co., Akron, O., assignee of R. L. Sibley, Nitro, W. Va., both in the U. S. A.

Germany

546,299. **Porous Rubber.** Franz Clouth Rheinische Gummiwarenfabrik A. G., Koln-Nippes.
546,689. **Improving Rubber Goods.** Deutsche Hydrierwerke A. G., Rodleben bei Rosslau, Anhalt.
546,690. **Vulcanizable Mixings.** I. G. Farbenindustrie A. G., Frankfurt a. M.

General

United States

1,847,217. **Heel Lift.** B. W. Klein, New York, N. Y.
1,847,218. **Hose and Coupling Assembly.** C. Lamb, Los Angeles, Calif.
1,847,758. **Steering Wheel.** H. D. Geyer, assignor to Inland Mfg. Co., both of Dayton, O.
1,847,777. **Adjustable Recoil Gun Pad.** W. J. Morgan, Youngstown, O.
1,848,018. **Boat.** A. G. Maranville, assignor to General Tire & Rubber Co., both of Akron, O.
1,848,123. **Train Pipe Connection.** E. E. Gold, New York, assignor to Gold Car Heating & Lighting Co., Brooklyn, both in N. Y.
1,848,333. **Blasting Cartridge Shell.** W.

R. Farren, Tamaqua, Pa., assignor to Atlas Powder Co., Wilmington, Del.
1,848,419. **Water Meter Disk Piston.** E. E. Gamon, Prince Bay, N. Y.
1,848,473. **Screen Shaker.** S. B. Gorbutt, assignor to Electric Steel Foundry Co., both of Portland, Ore.
1,848,533. **Nursing Nipple.** M. C. Lasky, Hollywood, Calif.
1,848,605. **Fountain Pen.** D. M. J. Conway, Jasper, Alta., Canada.
1,848,745. **Resilient Wheel.** J. Pavlecka, Wyandotte, Mich.
1,849,025. **Elastic Fabric.** O. F. Neidel, assignor to George C. Moore Co., both of Westerly, R. I.
1,849,026. **Sole.** L. M. Oakley, assignor to Essex Rubber Co., Inc., both of Trenton, N. J.
1,849,282. **Bootjack.** A. J. Churchill, Junction City, Kan.
1,849,781. **Tire Bead Reenforcing Element.** C. S. Arms, Worcester, assignor to Thompson Wire Co., Boston, both in Mass.
1,849,891. **Microphone.** P. D. Tyers, Watford, assignor to Igranic Electric Co., Ltd., London, both in England.
1,849,940. **Tire Pressure Indicator.** J. V. Lobdell, Jr., Rosedale, Miss.
1,850,004. **Vehicle Spring Suspension.** E. J. Farkas, Detroit, assignor to Ford Motor Co., Dearborn, both in Mich.
1,850,229. **Doorcheck.** F. K. Eastman, assignor to Concealed Door Check Co., both of Kokomo, Ind.
1,850,289. **Nonmetallic Connection.** C. Saurer, assignor to Mechanical Rubber Co., both of Cleveland, O.
1,850,391. **Sealing Ring.** L. A. Grimes, Montclair, assignor to Grimes Sprinkler Co., Inc., Newark, both in N. J.
1,850,541. **Tire Pressure Gage.** G. E. Farley, assignor to Service Equipment Co., both of South Gate, Calif.
1,850,660. **Swimming Appliance.** L. H. Coppel, Los Angeles, Calif.
1,850,662. **Tire Valve.** J. T. Crute, Virgilina, Va.
1,850,683. **Shaft Sleeve.** A. B. Merrill, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.
1,850,684. **Drive Ring.** T. D. Nathan, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.
1,850,748. **Fishing Float.** H. C. Foster, Kewanee, Ill.
1,850,855. **Loudspeaker.** A. A. Thomas, New York, N. Y.
1,850,959. **Breast Pump.** E. Lindquist, Malmo, Sweden.

Dominion of Canada

319,984. **Furniture Glide.** Perfect Caster Mfg. Co., assignee of W. R. Darnell, both of Long Beach, Calif., U. S. A.
320,036. **Nursing Nipple.** F. Brown, White House, N. J., U. S. A.
320,225. **Tie Rod End.** Thompson Products, Inc., Cleveland, O., assignee of M. P. Graham, Detroit, Mich., both in the U. S. A.
320,226. **Tie Rod End.** Thompson Products, Inc., Cleveland, O., assignee of G. H. Hufferd and M. P. Graham, co-inventors, both of Detroit, Mich., all in the U. S. A.
320,261. **Mail Box.** H. Koch and M. Weiler, co-inventors, both of Astoria, N. Y., U. S. A.
320,292. **Necktie.** L. E. Grossman, New York, N. Y., U. S. A.
320,306. **Shoe.** A. Mathern, Zurich, Switzerland.
320,381. **Laminated Glass Apparatus.** Duplate Corp., Pittsburgh, assignee of J. H. Sherts, Brackenridge, both in Pa., U. S. A.
320,465. **Railway Vehicle Roller Mounting.** F. Kruckenberg and C. Stedefeld, co-inventors, both of Hannover, Germany.
320,520. **Airplane Landing Gear.** C. B. Schumacher, Pittsburgh, Pa., U. S. A.
320,550. **Train Pipe Coupler.** Canadian Gold Car Heating & Lighting Co., Ltd., Montreal, P. Q., assignee of E. E. Gold, New York, N. Y., U. S. A.
320,577. **Mine Roller.** Goodyear Tire & Rubber Co., Akron, O., assignee of C. C. Hervey, Appleton, Wis., both in the U. S. A.
320,731. **Heel.** O. Schlappig, Düsseldorf, Germany.
320,744. **Valve Stem.** F. H. Watson, Jonesboro, Ark., U. S. A.
320,769. **Vibration Damper.** Budd Wheel Co., Philadelphia, Pa., assignee of R. H. Rosenberg, Detroit, Mich., both in the U. S. A.
320,827. **Footwear.** Kaufman Rubber Co., Ltd., assignee of J. C. Howard, both of Kitchener, Ont.
320,884. **Surfacing Apparatus.** Stratmore Co., assignee of H. R. Stratford, both of Cleveland, O., U. S. A.

United Kingdom

360,273. **Aircraft Plane.** J. Gerin, Levallois-Perret, Seine, France.
360,691. **Compass Shock Absorber.** Soc. Anon. Ottico Meccanica Italiana and G. Rosato, both of Rome, Italy.
361,054. **Pipe Coupling.** G. R. Morris, trading as Midland Brass Fittings Co., Birmingham.
361,224. **Endless Track Vehicle.** A. E. White, London. (McNeil Boiler Co., Akron, O., U. S. A.)
361,235. **Life Belt.** J. F. Kennedy, Baltimore, Md., U. S. A.
361,527. **Hair Waving Appliance.** G. Ducart, Paris, France.
361,572. **Tray.** Chance Bros. & Co., Ltd., and T. Bailey, both of Staffordshire.
361,599. **Massage Appliance.** R. H. Grimsley, Liverpool.
361,647. **Air Cushion.** J. H. Johnson, Toronto, Ont., Canada.
361,707. **Cap.** W. Schwalbe, London.
361,743. **Bottle Stopper.** T. Wilhelm, Zurich, Switzerland.
361,744. **Bottle Stopper.** V. P. Berger, Vienna, Austria.
361,764. **Boot Protector.** C. Hammer, Hamburg, Germany.
361,818. **Flexible Catheter.** M. F. Dow, London.
361,870. **Rontgen-ray Apparatus.** O. H. Pieper, Rochester, N. Y., U. S. A.
361,942. **Wrist Watch Strap.** E. D. Teague, of Dunlop Rubber Co., Ft. Dunlop.
361,977. **Hot Water Bottle.** India Rubber, Gutta Percha & Telegraph Works Co., Ltd., Aldwych, and S. D. Fergusson, of India Rubber, Gutta Percha & Telegraph Works Co., Silvertown, both of London.
362,041. **Card Clothing.** J. H. Roberts, Yorkshire.
362,072. **Microphone.** Associated Sound Film Industries, Ltd., London, assignee of L. de Forest, New York, N. Y., U. S. A.
362,089. **Boot Welt.** P. E. Barbour, assignee of W. G. Barbour, both of Quincy, Mass., U. S. A.
362,105. **Boot Tongue.** A. J. Tompkins and T. Richardson (Kingswell), Ltd., both of Northampton.
362,120. **Storage Battery Separator.** Young Accumulator Co. (1929), Ltd., and R. S. Harborne, both of New Malden.
362,186. **Inflatable Article.** G. MacLellan & Co., Ltd., and E. Beaven, both of Glasgow, Scotland.
362,470. **Machinery Bed.** L. Rado, Berlin, Germany.
362,494. **Phonographic Recorder.** H. E. Holman and P. W. Willans, both of London.
362,752. **Boot Upper Protector.** L. Andrews and Gutta Percha & Rubber (London), Ltd., both of London.
362,784. **Shaft Vibration Dampener.** Packard Motor Car Co., Detroit, Mich., U. S. A.
362,977. **Hose Pipe.** K. Schleicher, Thuringia, Germany.
363,025. **Paper Machine Roller.** F. R. Woodward, Newton Upper Falls, Mass., U. S. A.
363,063. **Motor Support.** Allgemeine Elektricitäts-Ges., Berlin, Germany.

Germany

546,617. **Syringe.** E. Wassmer, Geneva, Switzerland. Represented by A. Kuhn, Berlin.
546,851. **Ice Bag Closure.** L. Hescher, Frankfurt a. M., Wiesenau.
547,376. **Removable Corset Insets.** A. Schmidt, Berlin-Charlottenburg.
547,785. **Wheel.** Dunlop Rubber Co., Ltd., London, England. Represented by B. Kaiser and E. Salzer, both of Frankfurt a. M.
547,803. **Packing.** Schumann & Co., Leipzig.
548,050. **Heel.** A. Finke, Lohne i. W.

Designs

1,204,475. **Elastic Stocking.** H. Bonekamper, Wuppertal-Barmen.
1,204,506. **Cellular Inner Tube.** M. Werner and K. Illas, both of Elbing i. Ostpr.
1,204,866. **Dental Cleaning Disks.** F. Trebitsch, Berlin-Wilmersdorf.
1,205,040. **Photographic Apparatus.** A. G. Metzeler & Co., Munich.
1,205,079. **Leather and Rubber Patch.** A. Stubbe, Vlotho a. d. Weser.
1,205,135. **Cellular Tire.** A. Halbach, Remschied.
1,205,214. **Shoe Lace.** H. Dickhoff, Sterkrade.
1,205,220. **Heel Protector.** G. Kalb, Schw. Gmund.
1,205,224. **Double Pneumatic Tire.** M. Henke, Triebel i. d. N. L.
1,205,225. **Hose.** Berliner Gummiwaren-Fabrik Paersch & Kerstan, Berlin.
1,205,232. **Ski Gaiter.** F. Schwarzler, Oberstdorf i. Allgau.
1,205,240. **Shoe.** Hanauer Gummischuhfabrik Westheimer & Co., Hanau a. M.
1,205,241. **Canvas Shoe.** Hanauer Gummischuhfabrik Westheimer & Co., Hanau a. M.
1,205,458. **Footwear with Sock-like Upper.** Harburger Gummiwaren-Fabrik Phoenix A. G., Harburg-Wilhelmsburg.
1,205,459. **Heel Insert.** Harburger Gummiwaren-Fabrik Phoenix A. G., Harburg-Wilhelmsburg.
1,205,685. **Collapsible Boat Fabric.** Continental Gummi-Werke A. G., Hannover.
1,205,832. **Protective Edge for Mats.** Mitteldeutsche Gummi & Asbest-Gesellschaft m. b. H., Blankenburg, Harz.
1,205,971. **Elastic Railway Wheels.** Continental Gummi-Werke A. G., Hannover.
1,205,997. **Soles and Heels.** Harburger Gummiwaren-Fabrik Phoenix A. G., Harburg-Wilhelmsburg.
1,206,116. **Cudgel.** O. Blohm, Hamburg.

1,206,203. **Tire Pressure Indicator.** H. Hamer, Stralsund.
1,206,241. **Slip-over.** F. Vodarek, Vienna, Austria. Represented by B. Bomborn, Berlin.
1,206,257. **Swimming Glove.** W. Idzikowski, Berlin.
1,206,461. **Sticking Plaster.** Vulnoplast Lakemeier A. G., Bonn.
1,206,494. **Sponge Ball.** Masonia Rubber Works G. m. b. H., Wandsbek-Hamburg.
1,206,806. **Door Bumper.** Continental Gummi-Werke A. G., Hannover.
1,206,843. **Running Board Tread.** M. Rachner, Leipzig.
1,206,850. **Non-skid Sole.** J. Lampferhoff, Bonn.
1,206,880. **Automobile Door Rubber.** W. Schaefer, Sinzig.
1,206,924. **Printing Machine Roll.** H. Franzki, Eppstein i. d. Pfalz.
1,206,954. **Footwear.** Harburger Gummiwaren-Fabrik Phoenix A. G., Harburg-Wilhelmsburg.
1,206,963. **Permanent Wave Device.** E. Barth, Dresden.
1,207,007. **Arm Protector.** R. Zimmermann, Konigsberg i. Pr.
1,207,201. **Closure for Container.** O. Langhoff, Berlin-Charlottenburg.
1,207,234. **Inner Tube.** G. Sigl and J. Englert, both of Wurzburg.
1,207,486. **Glove.** Continental Gummi-Werke A. G., Hannover.
1,207,538. **Toy Vehicle.** M. Englehardt, Berlin-Wilmersdorf.
1,207,561. **Inflatable Figures.** I. and L. Dorogi and Dr. Dorogi es Tarsa Gummigyar, R. T., all of Budapest-Albertfalva, Hungary. Represented by R. H. Korn, Berlin.
1,207,744. **Divided Belting.** O. Doneit, Berlin-Steglitz.
1,207,778. **Surgical Instrument.** G. Wolf G. m. b. H., Berlin.
1,208,035. **Heel Patch.** H. Bade, Herzberg a. Harz.
1,208,043. **Comb.** Allgemeine Electricitats-Gesellschaft, Berlin.
1,208,101. **Rubberized Fabric.** Continental Gummi-Werke A. G., Hannover.
1,208,114. **Driving Belt.** Harburger Gummiwaren-Fabrik Phoenix A. G., Harburg-Wilhelmsburg.
1,208,361. **Anti-skid for Automobiles.** G. Wahler, Plauen i. V.
1,208,369. **Tire Cover.** Firma Georg Schwanz, Chemnitz.
1,208,552. **Door Frame Buffer.** Klockner Werke A. G., Castrop-Rauxel.
1,208,784. **Tire Cover.** F. Metschke and H. Stubenrauch, both of Cottbus.
1,208,905. **Hose Armature.** Firma Heinrich Leo, Gera.
1,208,954. **Gas Tube.** Continental Gummi-Werke A. G., Hannover.
1,209,143. **Overshoe.** E. Conrad, Bielefeld.
1,209,389. **Ring for Pails.** R. Hecht, Meisdorf a. Harz.
1,209,577. **Ball.** Firma Joseph Beyer, Wandsbek.
1,209,744. **Pessary.** H. Bosebeck and O. Schalber, both of Plochingen i. Wurtt.
1,210,043 **Hair Curler.** P. Brull, Beuel.
1,210,151. **Pessary.** O. Schaefer, Braunschweig.
1,210,180. **Hospital Bed Leg.** W. von Hagen, Iserlohn.
1,210,212. **Air Hammer Handle.** Continental Gummi-Werke A. G., Hannover.
1,210,254. **Inflatable Mattress.** Munden-Hildesheimer Gummiwaren-Fabriken Gebr. Wetzell A. G., Hildesheim.
1,210,279. **Automobile Wheel.** J. Brenner, Singen a. H.

Trade Marks

United States

291,749. Representation of the soles of 2 feet and the words: **"Ten Perfect Toes Two Healthy Feet."** Footwear. Wiswell-Everton Shoe Mfg. Co., Cedar Grove, Wis.
291,830. Representation of a man and the words: **"Tarzan Plastic Rubber."** Plastic compositions. Tarzan Plastic Rubber Co., Inc., Washington, D. C.
291,836. **Tapex.** Combs. New York Hamburger Gummi-Waaren Co., Hamburg, Germany.
291,869. **Silhouwelt.** Cement for footwear. United Shoe Machinery Corp., Boston, Mass.
291,874. Representation of, and the word: **"Puritan."** Filler. United States Gypsum Co., Chicago, Ill.
291,879. Shield bearing 2 crescent moons and the words: **"Mist o' the Moon."** Cosmetics. M. B. and J. G. Dilley, both of Los Angeles, Calif.
291,883. Circle containing representation of a hub and the words: **"Boston Rubber Shoe Co., Hub Mark, U. S. A., Boston, Mass."** Clothing. Boston Rubber Shoe Co., Malden, Mass.
291,884. Maltese cross containing the words: **"Top Notch Buddy."** Clothing. Beacon Falls Rubber Shoe Co., Beacon Falls, Conn.
291,950. **Tetrone.** Accelerators. E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.
291,962. **Fashion Plate.** Footwear. Johnson-Stephens & Shinkle Shoe Co., St. Louis, Mo.
291,979. **Krinkle-Krepe.** Caps. United Drug Co., Boston, Mass.
291,991. **Gates Vulco.** Belting. Gates Rubber Co., Denver, Colo.
291,996. **Cruiser.** Tires. Kelly-Springfield Tire Co., New York, N. Y.
292,024. Circle containing the letter: **"S"** and the word: **"Stoco."** Battery containers. Jos. Stokes Rubber Co., Trenton, N. J.
292,026. Diamond containing the words: **"Gen S Co."** Prophylactic articles. L. M. Schaeffer, doing business as General Sundries Co., Cleveland, O.
292,057. Label containing the words: **"Genuine Hard Rubber,"** and the letter: **"S."** Containers. Jos. Stokes Rubber Co., Trenton, N. J.
292,061. Square containing the representation of a bear and the sun, and the word: **"Skin."** Prophylactic articles. H. L. Ain, doing business as Goodwear Rubber Co., New York, N. Y.
292,070. Rectangle containing the word: **"Babette."** Sanitary belts, aprons, etc. Kaufmann Department Stores, Inc., Pittsburgh, Pa.
292,093. **Silverstripe.** Hot water bottles. Seiberling Latex Products Co., Barberton, O.
292,145. Representation of 3 castles, and the words: **"Three Dukes."** Prophylactic articles. H. E. Moyses, New York, N. Y.
292,197. Octagon, triple ruled, containing the word: **"Releef."** Patches. R. W. Fox, doing business as Releef Products Co., Birmingham, Ala.
292,199. **Collegiate.** Inflatable cushions. Essex Rubber Co., Inc., Trenton, N. J.
292,445. Words: **"Boartex, Trade Mark."** within a label. Waterproof coated material. J. C. Haartz Co., New Haven, Conn.
292,460. Label containing representation of a camel on a desert, and the word: **"Kamelskin."** Prophylactic articles. G. Aaronoff, doing business as Aaronoff Rubber Co., New York, N. Y.
292,467. Representation of 3 knights on horseback, and the words: **"Three Knights."** Prophylactic articles. H. E. Moyses, New York, N. Y.
292,501. **Hy-Da-Way.** Folding syringe. Seamless Rubber Co., Inc., New Haven, Conn.
292,570. **Faith.** Golf balls. Faith Mfg. Co., Chicago, Ill.
292,586. **Strad.** Golf balls. Donaldson Mfg. Co., Ltd., Glasgow, Scotland.
292,653. Label bearing a crest and the words: **"Stuart-Reed."** Raincoats. Sakowitz Bros., Houston, Tex.
292,662. **Nevrdi.** Elastic fabrics and cord. Ansonia O & C Co., Ansonia, Conn.
292,668. Circle containing the words: **"Rajah"** and **"Celulite."** Soles. Alfred Hale Rubber Co., Atlantic, Mass.
292,672. Shield bearing the word: **"Juniors."** Footwear. Marathon Shoe Co., Wausau, Wis.
292,688. Circle containing representation of a foot supported by a hand, and the words: **"Supreme, Anatomically Correct, It Braces, Arch Brace."** Footwear. P. Sullivan Shoe Co., Cincinnati, O.
292,707. Circle containing the words: **"Kalite, R. T. Vanderbilt Co., N. Y. American Products."** Filler. R. T. Vanderbilt Co., Inc., New York, N. Y.
292,717. Diamond containing the words: **"Dew Shu."** Spiked rubbers. National Crafts Co., New York, N. Y.
292,723. **Jay-Cobbs, Fifth Avenue Fashions at Penny Profits.** Footwear. Jay-Cobbs, Inc., New York, N. Y.

Labels

United States

40,314. **Vogue Cleaner.** Tire cleaner. Vogue Rubber Co., Chicago, Ill.
40,318. **Babypads.** Diaper lining. Dennison Mfg. Co., Framingham, Mass.

Prints

United States

13,602. **Electric Hot Water Pad with a Superlative Adjustable Automatic Electric Heater.** Heating unit. Super Appliance Corp., Ft. Worth, Tex.

Designs

United States

86,102. **Sole.** Term 7 years. E. S. Bellows, Portland, Ore.
86,193. **Tire.** Term 14 years. H. A. Brittain, Akron, O.
86,219. **Toy Balloon.** Term 7 years. Oak Rubber Co., Ravenna, O.
86,299. **Tire.** Term 14 years. H. A. Brittain, Akron, O.
86,326. **Heating Pad or Similar Article.** Term 14 years. G. Moessner, assignor to Seamless Rubber Co., Inc., both of New Haven, Conn.
86,473. **Tire.** Term 14 years. I. J. Remark, assignor to General Tire & Rubber Co., both of Akron, O.
86,479. **Tire.** Term 14 years. E. A. Roberts, Akron, O.
86,499. **Hot Water Bottle.** Term 14 years. J. Whitcomb, Lakewood, O., assignor to B. F. Goodrich Co., New York, N. Y.

EDITOR'S BOOK TABLE

Book Reviews

"The Law of Patents for Chemists," by Joseph Rossman, Ph.D., Washington, D. C. The Inventors Publishing Co., 1932. Cloth, 304 pages, 5½ by 8¼. Indexed.

Chemists and chemical engineers interested in invention will find in this book a comprehensive and authoritative discussion of chemical patents with full information on the procedures essential for securing and enforcing their patent rights. A glossary is given of words and phrases most commonly used in patent law followed by appendices illustrative of official classes and chemical patent application, statistics, annotated bibliography, and index.

"Neuzeitliche Reifenreparaturen." (Up-to-Date Tire Repairs.) Handbook for Repairers. By F. Grobowsky. Published by Union Deutsche Verlagsgesellschaft Zweigniederlassung, Berlin X. W. 19, Germany. Stiff paper, 6¼ by 9¼ inches, 185 pages, 190 illustrations.

This German handbook is by no means intended to teach anyone how to become a perfect tire repairer in a short time. Rather the aim is to enable those already in the business to improve their shops and workmanship by the discussion of tire repair problems and by acquainting them with the most up-to-date methods and equipment. The simple and concise text is appropriately illustrated by a large number of clear cuts showing a variety of repair problems, tools, and apparatus for small and large repair and retreading establishments, besides plans for shop layouts. Tables of tire and felloe sizes, temperature and pressures for vulcanizers help to enhance the value of what should prove to be a very useful and practical work.

"Plastics and Rubber Year Book, 1932." Casa Editrice Pollini, Milan, Italy. Cloth, 144 pages, 6½ x 9¼ inches. Indexed.

This yearbook, in Italian with preface in English, French, Italian, and German, is the first directory of the Italian molded plastics and rubber industries. Its publication was initiated for the benefit of suppliers of raw materials, chemicals, and modern machinery desiring to reach these rapidly developing branches of Italian manufacturing industry.

The lists include suppliers of plastic materials, plastic machinery, manufacturers, and users of molded products. Similarly the rubber section contains classified lists of dealers in materials and machinery for rubber goods manufacturers. The work concludes with a listing of producers and users of ebonite. Each list is preceded by appropriate text descriptive of the nature of the materials and processes.

This publication is to be followed shortly by a similar one by the same publishers devoted to the Italian paint and varnish industry.

New Publications

"Southwark-Emery Testing Machines." Baldwin-Southwark Corp., Southwark Division, Philadelphia, Pa. This illustrated bulletin describes the largest testing machine in the world built for the University of California which is only one of a large group of that type of testing machines covered by the company. Copies of this bulletin are gratis.

"Rubber and Composition Machinery New and Used." Stewart Bolling & Co., Inc., 5207 Lakeside Ave., Cleveland, O. This is an illustrated indexed stock list of machinery for the second quarter of 1932. It covers an extensive variety of available machines for all phases of rubber goods manufacturing. Each item listed is specified in detail and priced.

"Presses." Catalog No. 48C. The Dunning & Boschert Press Co., Inc., 336 W. Water St., Syracuse, N. Y. This catalog contains illustrated descriptions of hand and hydraulic presses, pumps, and accumulators for many industrial applications including steam plate presses for vulcanizing rubber goods.

"Hodgman Sporting Specialties for 1932." Hodgman Rubber Co., Malden, Mass. This 8-page booklet, attractively illustrated in colors, contains descriptions of rubber equipment for fishing, camping, boating, hunting, hiking, and water sports and includes such products as waders, rafts and floats, air beds, and rain shirts.

"Schrader 1932 Catalog." A. Schrader's Son, Inc., Brooklyn, N. Y. This attractive catalog in colors illustrates and describes the complete line of tire valve replacement parts and accessories. It also includes a revised valve practice chart, likewise one devoted to the new convertible valve practice.

Foreign Trade Circulars

Special circulars containing foreign rubber trade information are now being published by the Rubber Division, Bureau of Foreign and Domestic Commerce, Washington, D. C.

No.	Special Circulars
3240	Rubber Division special circulars, first quarter, 1932.
3241	British exports of automobile tires and inner tubes, calendar year 1931.
3242	German tire exports, January, 1932.
3243	Comparative exports of solid tires from the United States, Canada, United Kingdom, Germany, Italy, and France, calendar year 1931.
3244	Dealers' stocks of waterproof footwear in the United States, March 1, 1932.
3245	Italian tire exports, calendar year 1931.
3246	Canadian tire exports, February, 1932.
3251	United States rubber consumption survey, 1931.

Rubber Trade Inquiries

The inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The Editor is therefore glad to have those interested communicate with him.

No.	Inquiry
1473	Supplier of cordage or straw oil.
1474	Manufacturer of filled liquid centers for golf balls.
1475	Manufacturer of a rubber door knob protector.
1476	Manufacturer of latex impregnated twine.
1477	Manufacturer of rubber napkin rings.
1478	Manufacturer of Thalafries.
1479	Manufacturer of round rubber latex thread.
1480	Supplier of sheet rubber patching for inner tubes.
1481	Supplier of chlorinated rubber.
1482	Manufacturer of vulcanizer door gasket.
1483	Manufacturer of rubberized material suitable for making rubber aprons.

Foreign Trade Information

For further information concerning the inquiries listed below address United States Department of Commerce, Bureau of Foreign and Domestic Commerce, Room 734, Custom House, New York, N. Y.

Number	Commodity	City and Country
†56,970	Bicycle tires and semi-pneumatic truck tires	Belgrade, Yugoslavia
†56,983	Druggists' sundries	Mexico City, Mexico
*57,000	Rubberized cloth	Amsterdam, Netherlands
†57,011	Tires	Quito, Ecuador
†57,015	Hose	Medan, Sumatra
*57,042	Handbags	Edmonton, Canada
†57,053	Rubber soled canvas shoes	Belize, British Honduras
*57,098	Asbestos packing	Osaka, Japan
†57,099	Athletic and sporting goods, reclaimed rubber, industrial rubber, hard, pharmaceutical, dental, and medical specialties, bathing caps, balloons, etc.	Le Perreux, France
†57,100	Rubber bands	Oslo, Norway
†57,101	Surgical and bath articles	Warsaw, Poland
†57,103	Rubber goods	Alexandria, Egypt
†57,107	Sport goods	Berlin, Germany
†57,121	Belting and hose	Ahmedabad, India
†57,171	Druggists' sundries	Montreal, Canada
*57,176	Tires	Rosario, Argentina
†57,217	Smoked rubber sheets, thin pale latex crepe, and scrap truck tires	Buenos Aires, Argentina
†57,225	Balloons	Manila, P. I.
‡57,226	Surgeons' gloves	Amsterdam, Netherlands
†57,236	Erasers and rubber bands	Bologna, Italy
†57,243	Bathroom curtain material	Winnipeg, Canada
†57,267	Tires and tubes	Panama City, Panama
*57,340	Surgical gloves	Utrecht, Netherlands
†57,374	Elastic bands and erasers	Quito, Ecuador
‡57,442	Sport goods	Milan, Italy
†57,459	Scrap rubber	Hamburg, Germany
†57,463	Tires and automobile supplies	Prague, Czechoslovakia
*57,467	Unvulcanized rubber for stamps	Leipzig, Germany
†57,468	Jar rings	Santiago, Chile
†57,469	Household articles and sponge rubber specialties	London, Canada

* Purchase. † Agency. ‡ Either.

Dividends Declared

Company	Stock	Rate	Payable	Stock of Record
Goodyear Tire & Rubber Co.	Pfd.	$1.75 q.	July 1	June 1
Plymouth Rubber Co.	Pfd.	$1.75 q.	Apr. 15	Apr. 14
Stedman Rubber Flooring Co.	Pfd.	$1.75 q.	Apr. 1	Mar. 25

Lower Your Production Costs!
Raise the Quality of Your Compounds!

The production of ST. JOE Lead-Free ZINC OXIDE in commercial quantities commenced in February, 1931.

During this period the consumption of St. Joe Zinc Oxide by leading Rubber Manufacturers of the country has constantly increased; it has found its largest sale where quality and economy are important factors. The extreme uniformity and purity of St. Joe Zinc Oxide has become recognized wherever rubber compounds are made. We are pleased to refer to any of our ever increasing number of consumers.

The use of St. Joe Zinc Oxide lowers your production costs for the following reasons: (a) When used as an activator, its high chemical purity permits maximum value to be obtained from the pigment. (b) Because of this high chemical purity, it produces a normal rate of cure in high zinc oxide stocks, whereas pigments containing larger amounts of impurities tend to retard the rate of cure. (c) The particle size of St. Joe Zinc Oxide is extremely fine. Hence, it produces high reinforcing and activating properties.

ST. JOSEPH LEAD COMPANY . . . 250 PARK AVENUE, NEW YORK

Plant and Laboratory
Josephtown, Beaver County, Pa.

ST. JOE ZINC OXIDE

Distributor
S. H. Stewart Co
122 S. Michigan Ave
Chicago, Ill

Distributor
C. P. Hall Co.
of California
1340 East 6th Street
Los Angeles, Cal.

Distributor
H. M. Royal, Inc.
4814 Loma Vista Ave.
Los Angeles, Cal.

District Sales Representative
R. L. Cathcart
Oliver Bldg.
Pittsburgh, Pa.

Distributor
H. M. Royal, Inc.
Oakland and Norman Avenues
Trenton, N. J.

Distributor
William D. Egleston Company
34-38 Midway Street
Boston, Mass.

Market Reviews

Crude Rubber

REPORTS of plantations that have ceased tapping activities in Java are encouraging, of course, but the immediate effect on the market is negligible.

The latest cable advices from Batavia, Java, for instance, report that 212 estates have stopped tapping. Yet United States imports of crude rubber for March were 42,382 tons against 30,546 in February; while consumption was down to 27,828 tons. Malay shipments for April are lower than they have been, but the probability is that imports will again exceed production in April.

Domestic stocks, therefore, are still increasing. At March 31 they were 334,566 tons against 322,117 at the end of February. London and Liverpool stocks, however, are now 126,800 tons against about 138,400 at the same time last year.

The British figures would indicate that the lessened rate of output has already had some effect on stocks, but the cut is not large enough to change prices. But no one can deny that if estates close down or cease tapping voluntarily, that the long-term effect will not be beneficial. Because of the excessively large stocks on hand and the stagnant rate of consumption, many months will pass before an appreciable lightening in the load of overburdened stocks will be effected.

Consumption must first be lifted from its present level. That task can only be realized when and if the whole business picture becomes more normal. How or when that action will happen, we don't know.

The Outside Market has been very quiet. Buyers are not active, and traders find little incentive to sell at present prices, which show practically no margin.

The automobile and tire business has been a disappointment. With Ford and his 2 largest competitors announcing new models or new prices in the same week, it was expected that a battle royal would ensue for the favor of buyers who were holding back to see what Ford had to offer.

Mr. Consumer must have a better reason for not buying than waiting for Ford, however, because sales in the last month have fallen far below expectations. Ford has cut down production, and registrations indicate that even the usual seasonal increase has failed to materialize.

The uncertain political situation with no promise of the turn for which everyone is hoping probably has influenced buyers to hold on to their money. Recovery in this market, as well as in other commodity markets, seems to depend more and more on a strengthening of general confidence. There is no sign of it yet; so a continuance of the narrow and dull market is expected.

RUBBER BULL POINTS

1. **Tapping has ceased on over 200 estates and further voluntary curtailment effected, according to advices from Batavia, Java.**
2. **Production on estates of less than 100 acres was 11,434 tons in March against 14,241 in February; on large estates it was 18,462 tons against 18,731.**
3. **Stocks on hand on Malayan estates at the end of March were 20,831 tons against 21,165 at the end of February; dealers' stocks were 27,416 tons against 27,750.**
4. **Malayan exports are estimated at 35,000 tons for April compared with 39,903 tons in March and 42,008 in February.**
5. **Stocks in London and Liverpool on April 15 were about 126,800 tons against 138,400 last year at the same time.**
6. **Pneumatic casings on hand on February 29 were 3.8% less than on February 28, 1931, although they were 15.9% larger than at the end of January, 1932.**
7. **Crude rubber afloat to the United States on March 31 was 44,190 tons against 51,728 tons on February 29, 1932, and 47,350 on March 31, 1931.**

RUBBER BEAR POINTS

1. **New car registrations in 28 states gained only 11% in March against the usual seasonal increase of 33%.**
2. **Consumption of crude rubber in March was 27,828 tons against 30,012 tons in February, 15.1% lower than for March, 1931.**
3. **Imports of crude rubber for March were 42,382 tons, an increase of 38.7% over February and 5.1% over March, 1931.**
4. **Domestic stocks of crude rubber on March 31 were 334,566 tons, an increase of 3.9% over February and 53.6% over March 31, 1931.**
5. **Production of pneumatic casings for February increased 11.8% over January but was 2.9% less than in February, 1931.**
6. **Shipments of casings in February were 21.5% less than in January and 25.0% less than in February, 1931.**

Week ended April 2. In a dull, featureless market crude rubber prices sold off from 8 to 18 points. On Wednesday and Saturday a total of 80 tons were sold each day. Sales for the other 4 days did not average more than 275 tons.

April sold off to 2.95¢ and December to 3.38¢, both being new low records. A total of 454 transferable notices came into the market and influenced some liquidation. The weakness in stocks also affected the market somewhat.

Closing quotations, compared with those at the end of the previous week, follow: April was 2.95¢ against 3.13¢; May, 3.02 against 3.13; July, 3.12 against 3.20; September, 3.20 against 3.35; December, 3.38 against 3.48; and January, 3.45 against 3.55.

Launching 2 new models by automobile manufacturers raised the hope that the "hoarded" replacement demand would liquidate itself. Ford came out with his new 4 and 8 on Thursday, and Chrysler with his new Plymouth on Saturday. During the week Chevrolet lowered its prices on all models. Undoubtedly there is going to be a great battle for the favor of purchasers among these 3 manufacturers.

The importance of the automobile industry, which takes 4/5 of all rubber imported, naturally has a close relation to crude rubber prices. But its importance as a revivifier of business in general was pointed out in a recent editorial in the *Journal of Commerce*, which said:

"The importance of the automobile industry in the economy of the United States has frequently been pointed out. President Hoover estimated recently that one person in every 10 is directly or indirectly dependent for his livelihood on the manufacture of motor cars. The industry normally consumes about 1/6 of the aluminum produced in this country, ¼ of the sheet steel, half of the malleable iron, 2/3 of the plate glass, and 4/5 of the imports of rubber. . . . A large replacement demand (of automobiles) has been developing. The average life of a motor car is generally assumed to be about 7 years. On this basis replacements required for the 2 years, 1931 and 1932, should reach a total of 7,100,000. But domestic sales in 1931 were only about 2,000,000. This indicates an accumulated demand for 5,000,000. . . ."

The United States Department of Commerce announced on Monday that February production of automobiles in the United States and Canada was 122,890 vehicles compared with 229,811 a year ago. In the first 2 months of 1932 passenger car production in the United States totaled 192,791 cars against 317,696 in the same period a year ago.

For the last week, production of automobiles, according to Cram's Automotive Reports, was 36,546 units against 34,135 units in the week ended March 19. The increased output of Plymouth accounted for most of the gain, with Ford output gaining only a trifle. But now that Ford has launched his new models, it is expected that he will go on a full production schedule.

March shipments from Malaya were put at 39,903 tons against 42,008 for February. Ceylon shipments for March were 3,405 tons against 4,462 for February and 6,213 for March, 1931.

These figures indicate that some curtailment is going on, but the market paid little heed to the statistics. So much rubber is on hand that it must be several months before even drastic cuts in production remove the burden of the excessive stocks.

In the Outside Market, business was just as dull, if not duller, than it was on the Exchange. Automobile manufacturers are making a great outcry with their new models, but as yet their sales have fallen far short of expectations. In fact many companies have cut their schedules in order not to overload their dealers with cars.

The Malayan statistics were about as expected. While showing a lower trend, con-

sumption is also on the downside; so the net effect is unchanged.

At the close spot ribbed smoked sheets were quoted at 3 1/16¢ against 3 1/8¢ a week ago; rolled brown crepe was 2 7/8 against 2 3/4; first latex, 4 1/8 against 4 1/2; and No. 3 amber, 2 11/16¢ against 3¢.

Week ended April 9. Selling at 2.95¢, the new A contracts made an all-time low record on Friday. The day before the May Standard position had broken through to 2.98¢ for a new record. These price declines were registered in a market that was narrow and lifeless. Since the announcement that restriction negotiations were off between the British and the Dutch, the market has been characterized by its utter dullness.

No improvement in this state of affairs is apparent at present. With the huge stocks on hand, the rubber manufacturers in poor position, and plantations being forced to close or go on a maintenance basis, the same kind of a market may be expected for some time. Traders and speculators meanwhile take advantage of the small day-to-day fluctuations, and outside influences are felt in some degree.

In the last week the weakness in stocks and commodities induced by disappointment over the failure of Congress to show any force and determination in balancing the budget played its part in sending rubber to new low levels.

On Saturday a firmer tone in stocks sent rubber prices up from one to 3 points. Changes for the week amounted to from 3 to 13 points. April closed at 2.96 against 2.95; May was 2.99 against 3.02; July, 3.04 against 3.12; September, 3.14 against 3.20; December, 3.29 against 3.38; January, 3.36 against 3.45; and March, 3.49 against 3.62.

Details of the Malayan shipments for March showed that the amount received in the United States was 24,254 tons against 26,131 tons during February, a drop of about 7.2%. In March, 1931, the total was 31,307 tons; so the decline from a year ago was 22.5%.

Owing to imports of 6,678 tons from other sections, Malaya's own exports of rubber in March were 33,225 tons out of the gross 39,903 tons exported. In February the imports were 8,008 tons, and Malaya's actual exports were 34,000 tons out of the total 42,008 tons exported.

At a dinner in the Waldorf-Astoria in New York, George T. Bishop, president of the Continental Shares Corp., met with the leaders in the rubber industry to discuss their problems. One manufacturer expressed the opinion that nothing could be done to help the manufacturers except to reorganize individual companies:

"The illness of the industry is internal. It cannot, therefore, be cured externally. In the Far East, with its constant overproduction, lies the source of the illness. By reorganizing, the companies may be able to do something to cope with present abnormal prices and mounting stocks. If something were done to modify the anti-trust laws, there might be room for accomplishing something constructive by action among the companies."

The keen competition among manufacturers for declining tire sales, with the consequent price cutting and discriminatory deals, was given as a major reason for manufacturers' troubles by F. A. Seiberling.

Shipments of tires in January was 13.1% below those of the same month last year; while shipments for 1931 were 6.7% less than in 1930 and 27.9% less than in 1929.

The Outside Market was almost abandoned by both the trade and by factory buyers. No. 1 latex, which has been strong for some time, weakened during the week, with prices shaded 1/8¢.

The only factor in the market that held promise was the increased rate of automobile production. Ford doubled production in the week ended April 2 and now leads the field. Reports are that orders for 200,000 of his new cars were received before the models were put on display.

At the close on Saturday, April ribbed smoked sheets were selling at 3¢ against 3 1/16; May at 3 against 3 1/16; July-September at 3 1/4 unchanged. No. 2 amber was unchanged at 3¢; and up-river fine Paras was the same at 5¢.

Week ended April 16. With an average turnover of 225 tons per day the rubber market was virtually unchanged for the week, with prices showing net changes of from 1 to 6 points on the up side. It has been a dull, uneventful market varying little from previous weeks, and probably to be duplicated in future weeks.

At Saturday's close the April contract sold at 2.95¢ against 2.96 on the previous Saturday; May was 2.99 unchanged; July 3.01 against 3.04; September, 3.18 against 3.14; December, 3.35 against 3.29; and March, 3.51 against 3.49.

Private cables from Batavia reported that numerous rubber plantations in the Dutch East Indies are suspending production entirely and on many others the tapping of trees is being rapidly reduced. This action is an inevitable result of the low prices which crude rubber now commands, and in the next 6 months or a year shutdowns and curtailment may reduce the burdensome stocks on hand and leave the market in a better statistical position.

In the Far East, although exports during March were lower the stocks on hand were also reduced. At the end of March, stocks in the Far East were 47,577 tons compared with 51,945 tons at the end of February and with 44,317 tons a year ago. Rubber supplies at Harbor Board points were 3,515 tons against 5,189 tons in February and 3,983 last year.

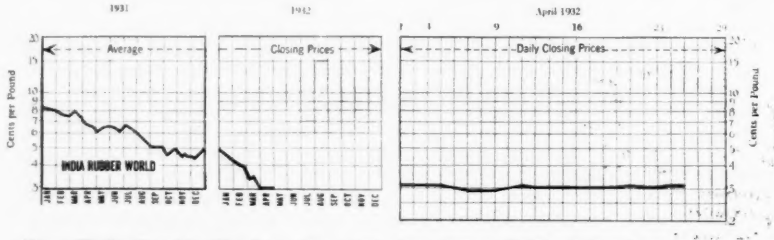
The Rubber Manufacturers Association, Inc., reported that production of pneumatic casings for February amounted to 3,871,220 units, an increase of 11.8% as compared with January this year, but 2.9% less than February, 1931. Shipments were 2,552,861 casings, a decline of 21.5% under January, and 25.0% below February, 1931. Casings on hand on February 29 were 9,172,245 units, an increase of 15.9% over January but 3.8% less than on February 28, 1931.

March consumption of crude rubber by manufacturers in the United States was only 27,828 long tons against 30,012 long tons for February, 1932, a drop of 7.3% and 15.1% below the March, 1931, figure.

Imports increased to 42,382 during March, a gain of 38.7% over February and 5.1% over March last year. Total domestic stocks on hand March 31 were 334,566 tons against 322,117 on February 29, which is 3.9% over February and 53.6% over those on March 31, 1931.

The Rubber Division of the Department of Commerce published its 1931 rubber report showing that total consumption was 350,000 tons, of which 123,000 tons was reclaim, a ratio of 35.1%. In 1930 the consumption was 376,000 tons, of which 153,500 tons, or 40.8%, was reclaim. The report states:

"The consumption of reclaimed rubber



New York Outside Market—Spot Closing Prices Ribbed Smoked Sheets

New York Outside Market—Spot Closing Rubber Prices—Cents Per Pound

	March, 1932				April, 1932																	
	28	29	30	31	1	2	4	5	6	7	8	9	11	12	13	14	15	16	18	19	20	21	22	23
Ribbed Smoked Sheet	3	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3	2 15/16	2 15/16	2 15/16	3	3 1/16	3	3	3	3	3	3	3	3 1/16	3	3
No. 1 Thin Latex Crepe	4 1/16	4 1/16	4 1/16	*4 1/16	4 1/16	4 1/16	4 1/16	4 1/4	4 1/16	4 1/16	3 15/16	3 15/16	4	4 1/16	4	4	4	4	4	4 1/16	4 1/16	4 1/16	4 1/16	4 1/16
No. 1 Thick Latex Crepe	4 1/4	4 1/4	4 1/4	4 1/4	4 1/4	4 1/4	4 1/4	4 1/16	4 1/4	4 1/16	4	4	4 1/16	4 1/16	4 1/16	4 1/16	4 1/16	4 1/16	4 1/16	4 1/16	4 1/16	4 1/16	4 1/16	4 1/16
No. 1 Brown Crepe	2 7/8	2 7/8	2 7/8	2 7/8	2 7/8	2 7/8	2 7/8	2 7/8	2 13/16	2 13/16	2 3/4	2 3/4	2 13/16	2 13/16	2 3/4	2 3/4	2 3/4	2 3/4	2 13/16	2 13/16	2 13/16	2 13/16	2 7/8	2 7/8
No. 2 Brown Crepe	2 13/16	2 13/16	2 13/16	2 13/16	2 13/16	2 13/16	2 13/16	2 13/16	2 3/4	2 3/4	2 13/16	2 13/16	2 3/4	2 3/4	2 13/16	2 13/16	2 13/16	2 13/16	2 3/4	2 3/4	2 3/4	2 7/8	2 13/16	2 13/16
No. 2 Amber	2 7/8	2 7/8	2 7/8	2 7/8	2 7/8	2 7/8	2 7/8	2 7/8	2 13/16	2 13/16	2 3/4	2 3/4	2 13/16	2 13/16	2 3/4	2 3/4	2 3/4	2 3/4	2 13/16	2 13/16	2 13/16	2 7/8	2 7/8	2 7/8
No. 3 Amber	2 13/16	2 13/16	2 13/16	2 13/16	2 13/16	2 13/16	2 13/16	2 13/16	2 3/4	2 3/4	2 13/16	2 13/16	2 3/4	2 3/4	2 13/16	2 13/16	2 13/16	2 13/16	2 3/4	2 3/4	2 3/4	2 7/8	2 13/16	2 13/16
No. 4 Amber	2 13/16	2 13/16	2 13/16	2 13/16	2 13/16	2 13/16	2 13/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 13/16	2 13/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 13/16	2 13/16	2 13/16	2 13/16	2 13/16
Rolled Brown	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16

has declined more than the consumption of crude rubber in each section of the industry, and that crude rubber replaced reclaimed rubber sufficiently in the heel and sole section and in the proofed goods section to account for a net gain in the consumption of crude rubber, by the companies included in these groups, in 1931 over the 2 preceding years. Consumption of reclaimed rubber has been better maintained by tire manufacturers than by manufacturers of other lines."

The low rate of business done in the Outside Market is best shown by the tire and the production figures of the automobile companies. In the first 7 states for which registration figures have been received, passenger car registrations were only 45% of those in March, 1931. In North and South Dakota they reached only 30% of last year's figures.

Ribbed smoked sheets sold at 3¢ at the week-end, unchanged from last Saturday. Latex sold at 3 15/16 against 4 last week; rolled brown crepe was 2 1/16 unchanged; and No. 3 amber was unchanged at 3¢.

Week ended April 23. Although changes were slight in the rubber market, trading was a bit more active. Prices fluctuated only within a few points, and for the entire week quotations were from 2 to 6 points higher. Much speculative buying added to the activity, with brokers buying nearbys and selling futures.

Sentiment in the outside markets such as cotton, grain, and stocks undoubtedly had some influence, but reports from the plantations and statistics on rubber itself had the strongest bearing on the market.

At the close of the 23rd, April sold at 2.97¢ against 2.95 at the end of the previous week; May was 3.01 against 2.99; July, 3.11 against 3.01; October, 3.30 against 3.24; December, 3.40 against 3.35; January, 3.46 against 3.37; and March, 3.57 against 3.51.

April shipments from Malaya were estimated at 35,000 tons, compared with 39,903 tons in March, 42,008 in February, and 42,638 in January. A steady decline since the first of the year seems to be one result of the low prices that followed the abandonment of restriction negotiations.

Private cables to the New York Exchange from Batavia on Saturday stated that tapping has ceased on 212 rubber plantations in the Dutch East Indies, involving a production area of 70,235 acres. Tapping of rubber trees on 121 other plantations, representing 43,672 acres, is being restricted voluntarily by the owners. The cable stated that this curtailment represented an untapped area of approximately 12% of the total rubber land under cultivation in 1931, or an annual output of about 20,000 tons.

Other cables received by the Exchange gave the Far Eastern Census figures for March. It was shown that on estates of less than 100 acres in British Malaya rubber production declined from 14,241 tons in February to 11,434 tons in March. Stocks on hand of Malayan estates were 20,831 tons at the end of March, compared with 21,165 tons at the end of February. Dealers' stocks declined from 27,750 to 27,416 tons.

These figures seem to indicate that gradually lower shipments from the Far East may be expected in the next months. One of the most encouraging signs is the curtailment shown by Dutch natives.

In a report issued by Munds, Winslow & Potter, the writer, L. G. Odell, states as his belief that "as far as the output of the Dutch native is concerned, it will cease almost entirely and the trend in this direction is attested to by the important emigration of natives from the Outer Possessions of the Dutch East Indies to Java; also, the official statements by government authorities as far back as last Fall, that native production had already become a matter of secondary importance, as those remaining were in a position to turn their attention to the raising of food crops; particularly sago and rice."

The same writer believes that production has reached its maximum and that adjustment of the large world stocks on hand will be made gradually in the next year or so. Consumption, he believes, will also increase somewhat this year because crude rubber is replacing reclaim in many instances and because the larger sized tires are becoming popular and require more rubber.

Prices in the Outside Market changed fractionally in the last week. April ribbed smoked sheets were quoted at 3¢ unchanged; May was 3 1/16 against 3; June, 3 1/8 unchanged; July-September, 3 1/4 against 3 3/16; and October-December, 3 3/8 against 3 7/16. Thick latex was 4¢ against 3 13/16; No. 2 brown, 2 7/8 against 2 13/16; rolled brown crepe, 2 3/4 against 2 11/16; No. 2 amber, 2 13/16 against 3; and No. 3 amber, 2 7/8 against 3. Upriver fine Paras was unchanged at 5 1/4.

Business was very quiet. The week ended April 16, automobile production hit a new low for the year with actual output of 35,778 cars according to Cram's Reports. Ford and Chevrolet were both producing at a lower level. Registrations in the first 28 states to report were 11% higher in March than in February, but since the normal seasonal rise is 33%, the extent of the decline is apparent. Consumer confidence seems to be difficult to encourage; so manufacturers must still hide their time.

On April 25 and 26 there were plenty of sellers at 3 1/8¢ and of buyers at 3¢ to replace the market at 3 1/16¢, which was the price for spot ribs on both days.

New York Quotations

Following are New York outside market rubber quotations in cents per pound for one year ago, one month ago, and April 26.

Plantations	Apr. 27, 1931	Mar. 28, 1932	Apr. 26, 1932
Rubber latex....*gal.*	75	51	51
Sheet			
Ribbed, smoked, spot	6 /6 1/8	3 1/8	3 1/16/3 1/8
May-June	6 1/8	,	3 1/8
July-Sept.	6 3/8/6 7/8	3 3/8	3 1/4/3 5/16
Oct.-Dec.	6 5/8/6 3/4	3 1/2	3 3/8/3 7/16
CREPE			
No. 1 Thin latex, spot	6 1/2	4 3/8	4 /4 1/16
May-June	6 5/8/6 1/2	...	4 /4 1/16
July-Sept.	6 3/4/6 7/8	4 5/8	4 1/8/4 3/16
Oct.-Dec.	7 /7 1/8	4 3/4	4 1/4/4 3/8
No. 2, Amber, spot.	6 /6 1/8	3 1/16	3 /3 1/16
May-June	6 /6 1/8	...	3 /3 1/8
July-Sept.	6 1/4/6 3/8	3 1/16	3 1/16/3 3/16
Oct.-Dec.	6 1/2/6 5/8	3 1/16	3 1/4/3 5/16
No. 3 Amber, spot..	5 7/8/6	3	2 13/16
No. 1 Brown.....	6	3 1/16	3
No. 2 Brown.....	5 7/8/6	3	2 7/8/2 13/16
Brown, rolled.....	5 5/8/5 3/4	2 7/8	2 11/16/2 13/16
PONTIANAK			
Bandjermasin	6 1/2	5	5
Pressed block	10 1/2	7 1/2	7 1/2
Sarawak	6 1/2	5	5
PARAS			
Upriver fine	8 1/4	5 3/8	5 1/4
Upriver fine *11		*8 1/4	*8
Upriver coarse	5 1/2	†2 1/2	†2 1/2
Upriver coarse	*7 1/4	*4 1/4	*4 1/4
Islands, fine	8 1/4	†5	†5
Islands, fine *10 3/4		*8	*7 3/4
Acre, Bolivian, fine.	8 3/4	5 1/2	5 3/4
Acre, Bolivian, fine.*11 1/4		*8 1/2	*8 1/4
Beni, Bolivian	8 3/4	5 1/2	5 3/4
Madeira, fine	8 1/4	†5 1/2	5 1/4

CAUCHO	Apr. 27, 1931	Mar. 28, 1932	Apr. 26, 1932
Upper ball	5	†2 1/2	†2 1/2
Upper ball	*7 1/4	*4 1/4	*4 1/4
Lower ball	4 1/2	†2	†2
Manicobas			
Manicoba, 30% guar.	†5	†2 1/2	†2 1/2
Mangabiera, thin sheet	†5	†2 1/2	†2 1/2
Guayule			
Duro, washed and dried	14	13	12
Ampar	15	14	13
Africans			
Rio Nuñez	...	8	8
Black Kassai	...	8	8
Manihot cuttings...	...	4	4
Prime Niger flake..	...	15	15
Accra flake	...	15	15
Gutta Percha			
Gutta Siak	11	8	7 1/2
Gutta Soh	22	17	16
Red Macassar.....1.75		1.50	1.50
Balata			
Block, Ciudad Bolivar	29	17	16
Colombia	...	...	...
Manaos block	29	17	16
Surinam sheet	55	35	32
Amber	57	37	35

*Washed and dried crepe. Shipment from Brazil.
†Nominal.

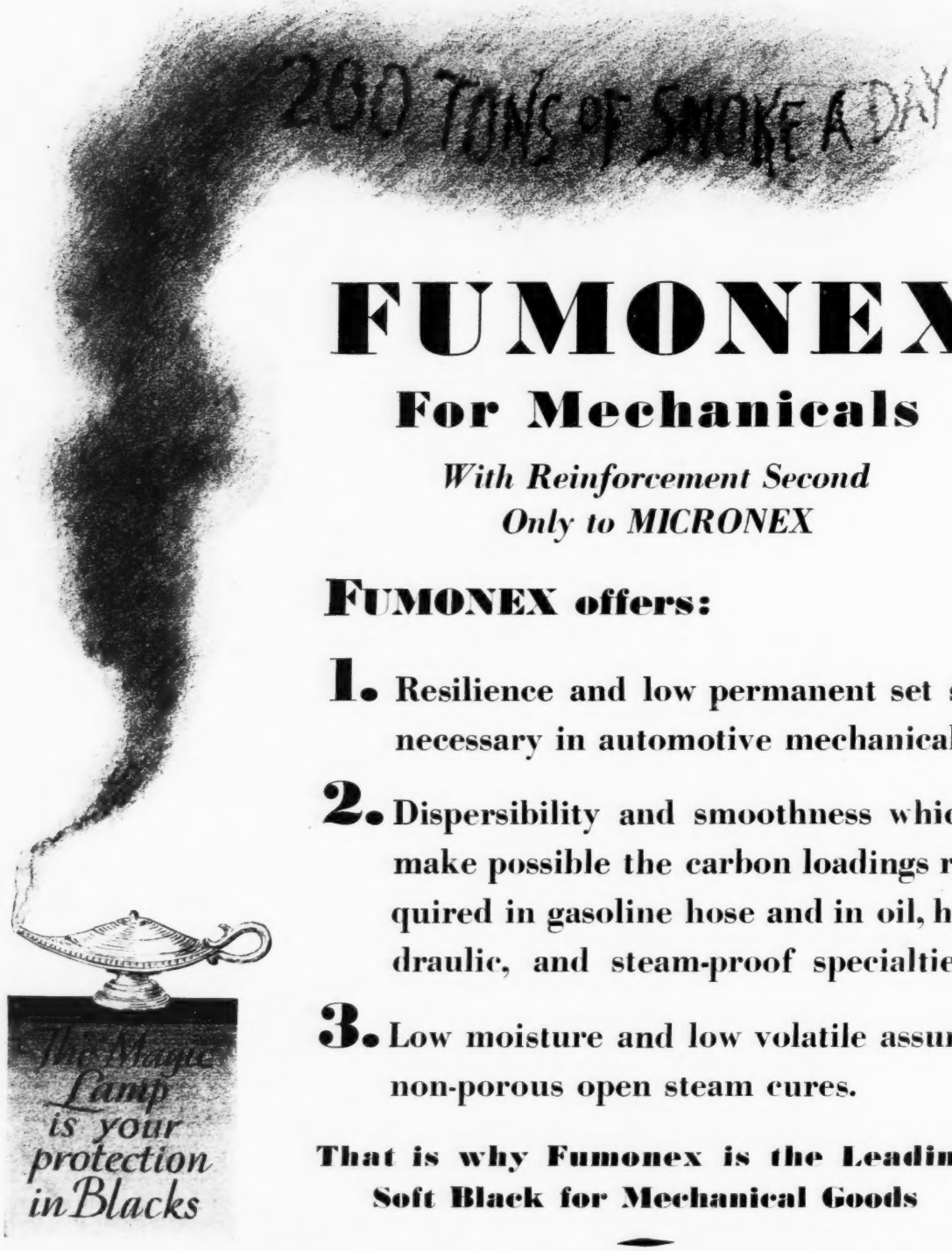
Price Differentials

Price differentials between the various grades of Hevea plantation rubber which shall prevail on all deliveries against the new "A" contracts, for May, 1932, follow:

No. 2 crepe (thick or thin) at 1 point; No. 2 ribs at 6 points; No. 3 ribs at 12 points; No. 4 ribs at 24 points; No. 5 ribs at 50 points; Limit of allowance on No. 2 crepe at 25 points; allowance on rubber delivered in bales at 8 points.

New Rubber Exchange Members

Recommendations that Edward A. Crawford and Walther J. Wessels be admitted as members in The Rubber Exchange of New York, Inc., have been approved by the Board of Governors. Mr. Crawford is a member of E. A. Crawford & Co., 60 Beaver St., New York, N. Y. Mr. Wessels is a partner in Wessels, Kulenkampff & Co., 113 Pearl St., New York.



FUMONEX

For Mechanicals

With Reinforcement Second Only to MICRONEX

FUMONEX offers:

1. Resilience and low permanent set so necessary in automotive mechanicals.

2. Dispersibility and smoothness which make possible the carbon loadings required in gasoline hose and in oil, hydraulic, and steam-proof specialties.

3. Low moisture and low volatile assure non-porous open steam cures.

That is why Fumonex is the Leading Soft Black for Mechanical Goods

BINNEY & SMITH CO.

41 East 42nd Street • New York, N. Y.

Compounding Ingredients

PRODUCTION in the rubber industry is proceeding very moderately. The usual spring seasonal increase of tires and mechanicals has not met customary expectations. Tire production is at little better than a third capacity; the demand for mechanical rubber goods is very spotty; footwear plants are off of heavy goods and engaged on light shoes and goods for summer and sports wear. Battery box output is improving as also is that of heels. Insulated wire and cable are very quiet owing to the stagnation that exists in the building trades.

ACCELERATORS. The popular low temperature accelerators are uniformly in steady demand.

AGE RESISTERS. These are equally active with accelerators, being quite as indispensable in modern rubber manufacturing practice.

ANTISCORCH. The latest addition to the group of materials used for the prevention of scorching is UTB. Added to highly accelerated mixings it prevents scorching of the rubber mix.

CARBON BLACK. Hand-to-mouth buying characterizes the want for carbon black. Throughout most of April the price of standard grade of rubber black was 3¢ a pound f.o.b. Texas and 3.1¢ f.o.b. Louisiana. In the last week of the month competition reduced these prices to 2¾¢ Texas and 2.85¢ Louisiana.

LITHARGE. Commercial grade in casks was nominally firm and unchanged at 5¾¢. Two ton lots continued to be offered at the carload price.

LITHOPONE. Steady moderate demand was at 4½ to 4¾¢ a pound in carload lots.

SOFTENERS. Degras is in fair demand with price firm. Stearic acid is steady in price and constant in demand.

SOLVENTS. Both heavy and light grades of petroleum solvents are in moderate demand at 6½¢ per gallon in tank cars at mid-continental refineries.

TITANIUM PIGMENT. Prices are firm. Its use in white rubber goods is meeting with increasing favor.

ZINC OXIDE. Early in April the price advanced ¼¢ a pound for less than carload lots, except for 2 tons or over. Demand is moderate.

New York Quotations

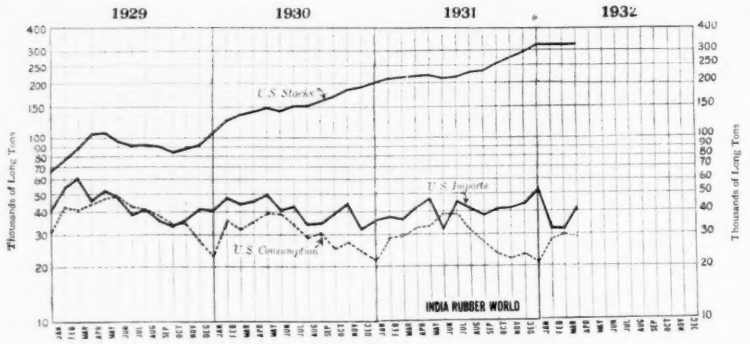
April 26, 1932

Prices Not Reported Will Be Supplied on Application

Abrasives		
Marble flour	ton	$16.00
Pumicestone, pwd.	lb.	.02½/$0.04
Rottenstone, domestic	ton	23.50 /28.00
English	lb.	
Silica, spot	lb.	.01¾
Accelerators, Inorganic		
Lime, hydrated	ton	20.00
Litharge, com., pwd., casks	lb.	.05¾
Magnesia, calcined, heavy	lb.	.06
carbonate	lb.	.05¾/ .06
Accelerators, Organic		
Aldehyde ammonia	lb.	.65 / .70
Altax	lb.	
Barak	lb.	
BLE	lb.	
Butene	lb.	
Captax	lb.	
Crylene	lb.	
paste	lb.	
DBA	lb.	
Di-esterex N.	lb.	
DOTG	lb.	.42 / .44½
DPG	lb.	.30 / .32½
Ethylidine aniline	lb.	.45 / .47½
Formaldehyde aniline	lb.	.37½/ .40
Grasselerator 808	lb.	
833	lb.	
Heptene	lb.	
base	lb.	
Hexamethylenetetramine	lb.	.46
Hydrone	lb.	
Lead oleate, No. 999	lb.	.11¾
Witco	lb.	.10
Lithex	lb.	
Methylene dianiline	lb.	
Monex	lb.	
Novex	lb.	
Phenex	lb.	.50 / .55
Plastone	lb.	
R & H 40	lb.	
50	lb.	
50-D	lb.	
397	lb.	
Retardex	lb.	.35
Safex	lb.	
SPDX	lb.	.70 / .75
Super-sulphur No. 1	lb.	
No. 2	lb.	
Tensilac 39	lb.	.40 / .42½
Thermlo F	lb.	
Thiocarbanilid	lb.	.25 / .27
Thionex	lb.	
TMTT	lb.	
Trimene	lb.	
base	lb.	
Triphenyl guanidine	lb.	.58 / .60
Tuads	lb.	
Ulto	lb.	3.00
Vulcanex	lb.	
ZBX	lb.	
Zimate	lb.	
Acids		
Acetic 28% (bbls.)	100 lbs.	2.65 / 2.90
glacial (carboys)	100 lbs.	9.64 / 9.89
Sulphuric, 66°	ton	15.50
Age Resisters		
Age-Rite Gel	lb.	
powder	lb.	
resin	lb.	
white	lb.	
Albasan	lb.	
Antox	lb.	
Stabilite	lb.	$0.54
Alba	lb.	.70 $0.75
VGB	lb.	
Zalba	lb.	
Antiscorch Materials		
UTB	lb.	
Antisun Materials		
Heliozone	lb.	
Sunproof	lb.	
Binders, Fibrous		
Cotton flock, dark	lb.	.08½/ .10
dyed	lb.	.50 / .85
white	lb.	.11 / .16
Rayon flock, white	lb.	1.40
colored	lb.	1.75
Colors		
BLACK		
Bone, powdered	lb.	.05½/ .15
Carbon (see Reenforcers)		
Drop (bbls.)	lb.	.05½/ .17
Lampblack (commercial)	lb.	.06 / .08
BLUE		
Blue toners	lb.	.80 / 3.50
Brilliant	lb.	3.50
Prussian	lb.	.35 / .37
Ultramarine	lb.	.06 / .30
BROWN		
Iron oxide	lb.	
Mapico	lb.	.14 / .15
Sienna, Italian, raw, pwd.	lb.	.04½/ .11
GREEN		
Brilliant	lb.	3.50
Chrome, light	lb.	.23 / .25½
medium	lb.	.26 / .27½
Chrome oxide	lb.	.23 / .26
Dark	lb.	1.30
Green toners	lb.	.85 / 3.50
Light	lb.	.70
ORANGE		
Cadmium sulphide	lb.	
Orange lake	lb.	.50
Orange toners	lb.	.40 / 1.60
ORCHID		
Orchid toners	lb.	1.50 / 2.00
PINK		
Pink toners	lb.	1.50 / 4.00
PURPLE		
Permanent	lb.	1.80
Purple toners	lb.	.60 / 2.00
RED		
Antimony		
Crimson, R. M. P. No. 3	lb.	.48
Sulphur free	lb.	.52
7-A	lb.	.35
Z-2	lb.	.20
Cadmium	lb.	.70 / .80
Chinese	lb.	.85
Crimson	lb.	.85
Iron Oxides		
FER-OX brand, f.o.b. New Castle, Pa.	lb.	.08¾
Rub-er-red	lb.	.08¾
Softex	lb.	.08¾
Mapico	lb.	.08½ .09
Medium	lb.	.85
Oxide, Spanish	lb.	.02¾
Red toners	lb.	$0.80 /$2.00
Scarlet	lb.	1.50
WHITE		
Lithopone	cwt.	.04½/ .05
Albalith	lb.	.04½/ .04¾
Cryptone No. 19	lb.	.06½/ .06¾
Cryptone CB No. 21	lb.	.06½/ .06¾
Grasselli	lb.	.04½/ .05
Titanium oxide, pure	lb.	20
Titanox "B"	lb.	.06¾/ .07
"C"	lb.	.06¾/ .07
Zinc Oxide		
Black label (lead free)	lb.	.05¾
F. P. (Florence, green seal	lb.	.09½/ .09⅞
red seal	lb.	.08½/ .08⅞
white seal (bbls.)	lb.	.10⅞
Green label (lead free)	lb.	.05¾
Green seal, Anaconda	lb.	.09½/ .10⅞
Kadox, black label	lb.	.09½/ .09⅞
blue label	lb.	.08½/ .08⅞
red label	lb.	.07¼/ .07½
Lehigh (leaded)	lb.	.05¼/ .05½
Red label (lead free)	lb.	.05¾
Red seal, Anaconda	lb.	.08½/ .09⅛
Selected (lead free)	lb.	.05¾/ .06
Special (lead free)	lb.	.05¾/ .06
Standard (leaded)	lb.	.05½/ .05¾
Sterling (leaded)	lb.	.05½/ .05¾
Superior (leaded)	lb.	.05½/ .05¾
U. S. P. (bbls.)	lb.	.12¾
White seal, Anaconda	lb.	.10⅞/ .11⅛
XX (lead free)	lb.	.05¾/ .06
green (lead free)	lb.	.05¾/ .06
red (lead free)	lb.	.05¾/ .06
zinc sulphide (bbls.)	lb.	.13
YELLOW		
Cadmium sulphide	lb.	.65 / .75
Chrome	lb.	.16
Lemon	lb.	1.50
Mapico	lb.	.11 / .12
Ochre, domestic	lb.	.01¾/ .02½
Yellow toners	lb.	2.50
Deodorant		
Rodo	lb.	
Factice—See Rubber Substitutes		
Fillers, Inert		
Asbestine	ton	15.00 /16.00
Barytes, white, spot	ton	33.00 /35.00
off color, spot	ton	
Foam "A" (f.o.b. St. Louis)	ton	23.00
Blanc fixe, dry, precip.	ton	70.00 /75.00
pulp	ton	42.50 /45.00
Infusorial earth	ton	35.00 /47.00
Kalite No. 1	ton	30.00 /60.00
No. 3	ton	40.00 /70.00
Suprex white, extra light	ton	60.00 /80.00
heavy	ton	45.00 /55.00
Whiting		
Chalk, imported	100 lbs.	.85 / 1.50
Precipitated	lb.	.03½/ .04
Domestic	100 lbs.	1.00
Paris white, English cliffstone	100 lbs.	1.75
Sussex	ton	
Witco	ton	20.00
Fillers for Pliability		
Flex	lb.	
Fumonex	lb.	.02½/ .06

P-33	lb.		
Thermax	lb.		
Velvetex	lb.	$0.02	/$0.05
Finishes			
Mica, amber	lb.	.04	
Starch, corn, pwd	100 lbs.	2.44	/ 2.64
potato	lb.	.07	
Talc, dusting	ton	20.00	/25.00
Italian	lb.	.02½	
Pyrax A	ton		
Inflating Material			
Sponge paste	lb.	.30	
Mineral Rubber			
Genasco (fact'y)	ton	40.00	/42.00
Gilsonite (fact'y)	ton	37.34	/39.65
Granulated M. R.	ton		
Hydrocarbon, hard	ton		
Parmr Grade 1	ton	23.00	/28.00
Grade 2	ton	23.00	/28.00
Mold Lubricants			
Sericite	lb.		
Soapbark (cut)	lb.	.07	/ .07½
Soapstone	ton	15.00	/20.00
Oils			
Castor, blown	lb.	.12½	/ .13
Poppy seed oil	gal.	1.60	
Red oil, distilled (bbls.)	lb.	.06½	/ .07¼
Protective Colloids			
Bentonite (dispersion clay)	lb.	.02½	
Casein, domestic	lb.	.06	/ .08
Reenforcers			
Aluminum flake	ton	21.85	/24.50
Carbon Black			
Aerfloted arrow black	lb	.02½	
Century (works, c. l.)	lb.	.02½	
Certified, Cabot, c. l., f. o. b. works, bags	lb.	.02½	
c. l., f. o. b. works, cases	lb.	.04¼	
l. c. l., f. o. b. works	lb.	.05½	
Disperso (works, c. l.)	lb.	.02½	
Dixie brand	lb.	.02½	.07
Elastex	lb.	.03½	/ .08
Gastex (f. o. b. fact'y)	lb.	.02½	/ .06
Kosmos brand	lb.	.02½	.07
Micronex	lb.	.03	/ .05
Ordinary (compressed or uncompressed)	lb.	.02½	.07
Clays			
Bento	lb.		
Blue Ridge, dark	ton		
China	ton	7.50	
Dixie	ton		
Dixie	lb.		
Langford	ton		
Lexo (works)	ton		
Par	ton		
Perfection	ton	8.00	
Standard	ton	7.50	
Suprex No. 1	ton	8.00	
No. 2, dark	ton	6.50	
Glue, high grade	lb	.20	/ .25
Rubber Substitutes or Factice			
Amberex	lb.	.15	
Black	lb.	.06	/ .08
Brown	lb.	.06	/ .11
White	lb.	.07	/ .12½
Softeners			
Burgundy pitch	lb.	.06	
Degras	lb.	.03	/ .04
Fluxol	ton	18.00	/80.00
Palm oil (Witco)	lb.		
Para-flux	gal.	.15	
Petrolatum, light amber	lb.	.02½	.02¾
Rosin oil, compounded	gal.	.35	
Rubberseed, drums	lb.	.07¼	
Rubtack	lb.	.10	
Tonox	lb.		
Witco Flux	gal.	.13	
Solvents			
Benzol (90% drums)	gal.	.25	
Carbon bisulphide (drums)	lb.	.05½	/ .12
tetrachloride	lb.	.06¼	.07
Dip-Sol	gal.		
Dryolene, No. 9	gal.		
Petrobenzol	gal.		
Rub-Sol	gal.		
Solvent naphtha (tanks)	gal.	.26	
Stod-Sol	gal.		
Troluoil	gal.		
Turpentine, dest distilled	gal.	.37	/ .38
Stabilizers			
Laurex, ton lots	lb.		
Stearates			
Aluminum	lb.		
Calcium	lb.		
Magnesium	lb.	.23	
Zinc	lb.	.23	
Stearex B	lb.	.06½	/ .10
flake	lb.	.06½	/ .10
Stearic acid, dbl. pres'd	lb.	.08	/ .12
Vulcanizing Ingredients			
Sulphur			
Chloride, drums	lb.	.03½	/ .04
Telloy	lb.		
Vandex	lb.		
(See also Colors—Antimony)			

Imports, Consumption, and Stocks



United States Stocks, Imports, and Consumption

CONSUMPTION of crude rubber by manufacturers in the United States for March amounted to 27,828 long tons as compared with 30,012 long tons for February, 1932, and represents a decrease of 7.3%, and 15.1% below March, 1931, according to The Rubber Manufacturers Association.

This organization reports imports of crude rubber for March to be 42,382 long tons, an increase of 38.7% over February and 5.1% above March a year ago.

This association estimates total domestic stocks of crude rubber on hand March 31 at 334,566 long tons, which compares with February 29 stocks of 322,117. March stocks show an increase of 3.9% above February of this year and 53.6% above those of March 31, 1931.

Crude rubber afloat for United States ports on March 31 is reported as 44,190 long tons, which compares with 51,728 long tons afloat on February 29, 1932, and 47,350 long tons afloat on March 31 last year.

London and Liverpool Stocks

Week Ended	Tons	
	London	Liverpool
Apr. 2	63,813	61,010
Apr. 9	64,015	60,832
Apr. 16	63,717	61,302
Apr. 23	63,348	61,433

United States Crude and Waste Rubber Imports for 1932 by Months

		Plantations	Latex	Paras	Africans	Centrals	Guayule	Manicoba and Matto Grosso	Totals 1932	Totals 1931	Balata	Miscellaneous	Waste
Jan.	tons	30,847	271	142	38	..	..	..	31,298	37,098	53	731	50
Feb.		30,041	361	144	..	..	..	..	30,546	36,645	98	689	..
Mar.		41,753	335	240	54	..		..	42,382	40,338	65	754	25
Total, 3 mos., 1932	tons	102,641	967	526	92	..		..	104,226	.....	216	2,174	75
Total, 3 mos., 1931	tons	111,196	897	1,909	78	1	.	..	.....	114,081	236	2,340	38

Compiled from The Rubber Manufacturers Association, Inc., statistics.

United States and World Statistics of Rubber Imports, Exports, Consumption, and Stocks

Twelve Months	U. S. Net Imports* Tons	U. S. Consumption Tons	U. S. Stocks on Hand† Tons	U. S. Stocks Afloat† Tons	United Kingdom Stocks†‡ Tons	Singapore and Penang, Etc., Stocks†‡ Tons	World Production (Net Exports)‡ Tons	World Consumption Estimated‡ Tons	World Stocks†‡§ Tons
1926	411,962	358,415	72,510	51,238	50,074	26,443	614,778	533,915	149,026
1927	431,807	372,528	100,130	47,938	65,663	25,798	605,196	589,128	193,146
1928	446,421	442,227	66,166	68,764	22,691	32,905	649,674	667,027	122,828
1929	561,454	466,475	105,138	62,389	73,276	36,768	863,410	785,475	228,572
1930	488,343	375,980	200,998	56,035	118,297	45,179	821,815	684,993	366,034
1931	495,163	348,986	322,826	53,940	127,103	55,458	797,441	668,660	495,724
1932									
January	31,298	27,962	322,860	42,234	125,276	59,836	63,627	50,480	507,962
February	30,546	30,012	322,117	51,728	125,958	56,684	59,871	51,230	504,759
March	42,382	27,828	334,566	44,190	.....	.....	.....	.....	.....

*Including liquid latex, but not guayule. †Stocks on hand the last of the month or year. ‡W. H. Rickinson & Son's figures. §Stocks at the 3 main centers, U. S. A., U. K., Singapore and Penang.

Cotton and Fabrics

IT IS still too early in the planting season for weather and crop news to affect the market greatly; consequently, in the past month cotton has looked to outside factors. These, unfortunately, have not been of a nature to encourage higher prices. The failure of the House of Representatives to adopt the sales tax resulted in the substitution of miscellaneous levies which Secretary Mills declared would not balance the budget.

Then the Senate took over the bill and will probably work on it for another month if not more. The danger of bringing tariff imposts into the bill, and the taxes that are said to be confiscatory, such as the tax on stocks, sent the stock and the commodity markets to new low ground. The Senate inquisition of the stock market bears has also kept the market fluctuating.

The cumulative effect of these things has been to retard the confidence that it was hoped the Reconstruction Finance Corp. and the new Glass-Steagall Banking bill would strengthen. The consumer's dollar is still frozen, as evidenced by the abnormally low rate of cotton cloth production and sales.

International affairs are no more encouraging with Britain omitting her debt payments to us in her new budget and with the Lausanne conference on debts in the offing. In spite of their apparent efforts at stabilization the politicians have contributed little constructive help thus far.

The size of the new crop is of paramount importance as far as cotton prices go. American cotton so far this season has been taken on a much larger scale by world spinners than last year, and our exports, largely because of the greater demand from the Orient, are running far ahead of those of the last 2 seasons.

Much cotton is still held by farmers and may be dumped on the spot market in the next few months; but if everything points to a smaller crop, not only will these farmers hold their cotton for the better prices that would surely follow, but spinners would replenish the minimum stocks they have been holding in the declining market. Until the new crop becomes dominant in the news, the market will be largely influenced by general conditions existing.

COTTON BEAR POINTS

1. **The total stock of cotton in all hands on March 31 was 13,407,000 bales against 9,422,000 on the same date last year and 6,970,000, 2 seasons ago.**
2. **A cut in acreage of only 10% is expected.**
3. **Cotton cloth production has been curtailed sharply but will probably be above sales for April.**
4. **Demand for cotton goods has not materialized even to the extent of normal seasonal demand.**
5. **Unstable price levels in the cloth markets has made large converters and commission houses hesitant about buying.**
6. **Large holdings of spot cotton may be released in the next few months.**
7. **Consumption of cotton during March was 488,655 bales against 490,509 in March, 1931.**
8. **Sales of cotton cloth in March were 58% of production; shipments were 93.1% of output.**
9. **Unfilled orders in the first quarter of 1932 declined 13.6%.**
10. **Manchester mills have had to curtail production to meet lessened demand.**

COTTON BULL POINTS

1. **Japan is using 70 to 75% American cotton at present against 25 to 30% Indian cotton. Last season the proportion was 50-50.**
2. **Exports to April 16 of the present season were 7,142,000 bales against 5,817,000 in the same period last year and 6,048,000 in 1930.**
3. **The 1931 crop was of exceptionally high quality, 89.4% being of contract grade.**
4. **Reduction of fertilizer sales by 35 to 50% and possibility of insect damage may work for a small crop.**
5. **Dry top soil and lack of rain have retarded the start of the crop in some sections of Texas and Oklahoma.**
6. **Stocks of cotton cloth on hand decreased 10.7% in the first quarter of 1932, reflecting the effort to bring production in line with sales.**
7. **In the first 7 months of this season 7,201,000 bales of American cotton were consumed against 6,275,000 in the same period last year, a 15% increase.**

Week ended April 2. With a net decline in prices of about 35 points for the week the cotton market approached the season's low marks. After being closed over the last week-end for the Easter holiday, the market reopened as quotations dropped from 26 to 31 points on Monday morning.

Since the Liverpool market was closed on Monday, the market there was confronted with heavy selling pressure when it reopened on Tuesday. Liverpool prices broke 40 points, with heavy arbitrage operations in evidence. Short covering in our own market limited the losses to from 5 to 9 points on Tuesday.

The market gained about 20 points on Wednesday and lost them again on Thursday. The apprehension caused by the failure of the House to pass legislation that would balance the budget was erased when substitute levies were passed, which raised the revenue that the sales tax would have yielded. But the heavy tax put on stock transfers aroused a storm of protest in Wall Street and caused stock prices to sell off sharply. In sympathy with the decline in stocks, the cotton market sold off. At the week-end the tone was soft.

Acreage figures coming into the market during the week did not bolster sentiment to any degree. The estimate of a 10% reduction seems to have been too high. Two private reports put reduction at 9.2% and 7.3%. The Fairchild service stated that farmers intend to plant approximately 37,541,000 acres in cotton, a reduction of 8% from the total 1931 acreage. The weather in the South has been warm and favorable for further planting operations and probably contributed somewhat to the selling movement.

Wholesale dry goods firms reported that

New York Quotations

April 26, 1932

Drills		Cents
38-inch 2.00-yd.	yd.	$0.08½
40-inch 3.47-yd.		.05
50-inch 1.52-yd.		.12
52-inch 1.90-yd.		.09½
52-inch 2.20-yd.		.08
52-inch 1.85-yd.		.09½

Ducks		
38-inch 2.00-yd. D. F.	yd.	.08½
40-inch 1.45-yd. S. F.		.12
72-inch 1.05-yd. D. F.		.18½
72-inch 16.66-oz.		.20
72-inch 17.21-oz.		.22
MECHANICAL		
Hose and belting	lb.	.17½
TENNIS		
52-inch 1.35-yd	yd.	.13

Hollands		
RED SEAL		
36-in.	yd.	.11½
40-in.		.12
50-in.		.17½
GOLD SEAL		
40-in., No. 72	yd.	.14½

Tire Fabrics		Cents
BUILDER		
17¼ oz. 60" 23/11 ply Karded peeler	lb.	$0.22
17¼ oz. 60" 10/5 ply Karded peeler	lb.	.20
CHAFER		
14 oz. 60" 20/8 ply Karded peeler	lb.	.22
12 oz. 60" 10/4 ply Karded peeler	lb.	.18
9¼ oz. 60" 20/4 ply Karded peeler	lb.	.24
9¼ oz. 60" 10/2 ply Karded peeler	lb.	.20
CORD FABRICS		
23/5/3 Karded peeler, 1 3/16" cotton	lb.	.22
23/4/3 Karded peeler, 1 1/16" cotton	lb.	.24
15/3/3 Karded peeler, 1 1/16" cotton	lb.	.20
13/3/3 Karded peeler, 1 1/16" cotton	lb.	.19
7/2/2 Karded peeler, 1 1/16" cotton	lb.	.19
23/5/3 Karded peeler, 1¼" cotton	lb.	.28
23/5/3 Karded Egyptian, Egyptian upper cotton	lb.	.35
23/5/3 Combed Egyptian	lb.	.40
LENO BREAKER		
8¼ oz. and 10¼ oz. 60" Karded peeler	lb.	.22

Osnaburgs		Cents
40-in. 2.35-yd.	yd.	$0.07⅛
40-in. 2.48-yd.		.06¾
40-in. 3.00-yd.		.05½
40-in. 10-oz. part waste		.08¾
40-in. 7-oz.		.06⅛
37-in. 2.42-yd.		.06⅞

Raincoat Fabrics		
COTTON		
Bombazine 64 x 60	yd.	.08½
Bombazine 60 x 48		.07½
Plaids 60 x 48		.08¾
Plaids 48 x 48		.07½
Surface prints 64 x 60		.10¼
Surface prints 60 x 48		.09¼
Print cloth, 38½-in., 64 x 60		.03¾
Print cloth, 38½-in., 60 x 48		.03¾
SHEETINGS, 40-INCH		
48 x 48, 2.50-yd.	yd.	.05½
48 x 48, 2.85-yd.		.05
64 x 68, 3.15-yd.		.05⅜
56 x 60, 3.60-yd.		.04¾
44 x 48, 3.75-yd.		.04
44 x 40, 4.25-yd.		.03½
SHEETINGS, 36-INCH		
48 x 48, 5.00-yd.	yd.	.03¼
44 x 40, 6.15-yd.		.02⅞

sales have been falling behind production; so it may be necessary, to avoid further accumulations of stock, to curtail production. March was a quiet month, and the New York Cotton Exchange Service estimates that sales will probably be below normal.

World stocks of Indian cotton were only 4,184,000 bales at the close of January against 6,040,000 on the same date last year, and indications are that the shortage will be made up through purchases of larger amounts of American cotton.

At the close of the week April sold at 6.08¢ against 6.44 at the end of last week; May was 6.14 against 6.50; July, 6.31 against 6.66; October, 6.52 against 6.87; December, 6.66 against 7.02; and January, 6.77 against 6.81.

Week ended April 9. Depressed by the failure of Congress to enact tax legislation, by weakness in stocks, and by poor conditions in the cotton spinning industry, cotton prices reached the lowest levels since the 1898-99 season. On Thursday the May contract hit 5.92¢ and October 6.35¢.

On Saturday occurred a rally of 12 to 15 points, however, in response to improvement abroad and a better tone in stocks and grain. For the week the change was from 1 to 10 points lower. April closed at 6.07 against 6.08 last week; May was 6.13 against 6.14; July, 6.31 unchanged; October, 6.57 against 6.52; December, 6.74 against 6.66; and March, 6.97 against 6.89.

News from the cotton belt indicated better weather, and forecasts are that the crop will show little change in acreage. Fertilizer sales, however, are far below normal. The National Fertilizer Assn. reported that tag sales in the cotton states have been 1,183,692 tons against 2,309,472 in 1931 and 3,473,485 in 1930. Sales in March were 644,192 tons compared with 1,353,373 last year. The reduction for the season is 49% up to the present time.

Japanese interests were reported to be selling heavily in the market; the reason was not apparent. But H. Hentz & Co. said:

"Frankly, we think their short sales in this market will within a reasonable time show a handsome profit."

The Japanese are among our best customers. In February, according to the New York Cotton Exchange Service, they took 216,000 equivalent 500-pound bales, against 187,000 in February, 1931. They consumed about 739,000 bales of American cotton in the 7 months ended February 29 against 518,000 in the same period last year. Exports from the United States in the 7 months have been 1,696,000 bales against 741,000 last season.

Cotton goods sales are at a low ebb, and March statistics are expected to be unfavorable. Last week manufacturers representing 70,000 looms met in Spartanburg, N. C., and agreed to close down their mills for one week in April, May, June, and July. This move is an effort to curtail production so as not to exceed sales. Prices of cloth have held up so far; but if curtailment is not effected soon, reductions may be in order.

Week ended April 16. The better tone in the wheat market and the improvement due to favorable reaction to the bond buying of the Federal Reserve Banks raised

WEEKLY AVERAGE PRICES OF MIDDLING COTTON

Week Ended	Cents per Pound
Apr. 2	6.28
Apr. 9	6.18
Apr. 16	6.28
Apr. 23	6.15

cotton prices to their April peak on Thursday, some 30 to 50 points above the lowest point for the month. But on Friday and Saturday, revised upward figures on plantings, realization, and lower prices in stocks and grains erased most of the gain, and closing prices were practically the same as those in the previous week. April was 6.06 against 6.07 last week; May, 6.13 unchanged; July, 6.31 unchanged; October, 6.54 against 6.57; December, 6.72 against 6.74; January, 6.80 against 6.83; and March, 6.97 unchanged.

The weather has been good in the planting states, and a reduction of under 10% is all that is expected. The fact that fertilizer sales have been far behind last year's, however, may mean a smaller crop.

Sales of carded cotton cloths during March were only 58.1% of production, but since the figure was expected, it did not influence the market adversely. The agreement by 90% of southern mills making print cloth to curtail production during April, May, and June, shutting down their plants one week each month, was received favorably by the trade.

The Association of Cotton Textile Merchants of New York reported production of 285,252,000 yards in March, against new business of 165,850,000 yards. Shipments were 93.1% of output. For the first quarter of the year shipments were 104.1% of output and sales were 98.3% of production. Stocks on hand decreased 10.7% during this period, and unfilled orders dropped 13.6%.

The Census Bureau reported that cotton consumed during March was 488,655 bales of lint and 54,229 bales of linters, against 450,018 and 52,764 in February and 490,509 and 64,003 in March, 1931. March exports totaled 927,127 bales of lint and 11,708 of linters, compared with 970,419 and 10,223 in February and 605,461 and 10,456 in March last year. For the first quarter of 1932 exports totaled 2,816,884 bales against 1,571,262 last year. A similar condition for cloth production seems to exist in England. In the section of Lancashire spinning Egyptian yarns 85% of the firms have agreed voluntarily to curtail production 20% for 6 weeks, effective at once. These spinners control about 15,000,000 spindles.

Week ended April 23. Cotton prices sold off on every day of the week except one. Disappointing business conditions and the failure of Congress to unite on constructive legislation sent stock and commodity prices to lower levels, with cotton trailing them downward.

Quotations were off from 16 to 17 points. The May contract closed at 5.95 against 6.13 at the end of last week; July was 6.14 against 6.31; October, 6.38 against 6.54; December, 6.55 against 6.72; January, 6.62 against 6.80; and March, 6.78 against 6.97.

A constructive feature in the market was the report by the New York Cotton Exchange Service that the use of American cotton by the Orient has gained materially in the present season. Last season Japanese spinners used about 60% Indian cotton and 40% American. In the first half of the present season they used 50% each of the 2 grades. But now they use but 25 or 30% of Indian cotton, and 70 or 75% American cotton.

"If this is continued," says the Exchange Service, "Japan will use about 300,000 more bales of American cotton in the second half than in the first half of the season, or around 930,000 bales, compared with 630,000. Sales of yarn and cloth by Japanese spinners during the last 2 or 3 weeks are reported somewhat above current production. Mill activity is being well maintained at a high level."

Exports to the Far East are another bright spot. With exports running almost 1,400,000 bales ahead of those last season, most of the increase is due to shipments to China and Japan.

The cotton cloth industry is not doing so well. Production is being curtailed more and more, but sales are still said by the New York Cotton Exchange Service to be below production. Those manufacturers who led the recent movement for curtailment are now advocating a 50% cut. The principal purpose of this cut, according to some traders, would be merely to maintain prices of cloth at or near their present level.

The weather in the Cotton Belt has been good on the whole, with rain falling in Oklahoma and the Houston districts where it was needed. Portions of the eastern and the western belts still need more moisture. The crop has been held back somewhat because of high winds and cool weather. Greater planting activity is expected about May 1.

Fertilizer sales in Texas have been cut from 35 to 50%. In some portions of the country where credit is very restricted no fertilizer will be used. How much acreage will be cut is still uncertain, with probably the majority of estimates ranging around 10%.

On April 25 spot middlings on the New York market was steady at 5 points advance to 6.15¢. On April 26 the price of spot was unchanged and quiet on the exchange. Futures closed as follows: May, 5.98; June, 6.07; July, 6.16; August, 6.24; September, 6.31; October, 6.39; November, 6.46; December, 6.54; January, 6.62; February, 6.70; March, 6.78.

Cotton Fabrics

DUCKS, DRILLS, and OSNABURGS. The market for these fabrics is dull, and prices are somewhat easier. Cotton textile demand for the next 3 months will probably rise and fall in accordance with the fluctuations in general business activity. Today's market is a waiting one.

RAINCOAT FABRICS. The raincoat business, like all other lines of merchandising, is dull. Only small quantities of the best numbers are being sold.

SHEETING. The market is generally quiet and uninteresting. There are no outstanding features or indications calling for comment.

TIRE FABRICS. Actual sales of tire fabrics have not improved. They are of the small volume typical of the past several months.

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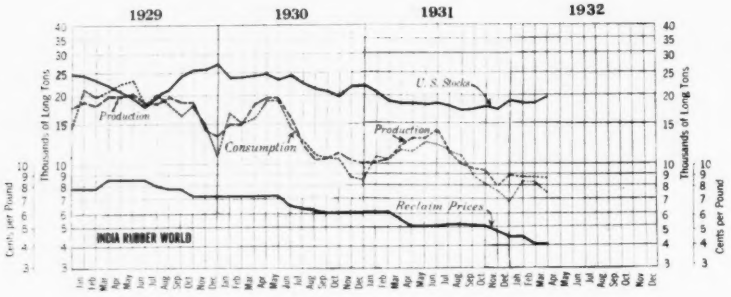
NEW YORK

Reclaimed Rubber



Production, Consumption, Stocks, and Price of Tire Reclaim

United States Reclaimed Rubber Statistics—Long Tons

Year	Production	Consumption	Consumption Per Cent to Crude	United States Stocks*	Exports
1925	132,930	137,105	35.6	13,203	4,571
1926	180,582	164,500	45.9	23,218	5,391
1927	189,144	178,471	47.6	24,980	8,540
1928	208,516	223,000	50.4	24,785	9,577
1929	219,057	224,253	47.9	27,464	12,721
1930	157,967	153,497	41.5	24,008	9,468
1931	132,462	125,001	35.7	19,257	6,971
1932					
January	8,753	8,440	30.2	18,712	475
February	8,731	8,332	27.6	18,659	484
March	8,613	7,420	26.7	19,726	....

*Stocks on hand the last of the month or year.

Compiled by The Rubber Manufacturers Association, Inc.

THE ratio of reclaimed used to crude suffered another decline during March. The percentage stood at 26.7 at the end of March against 27.6 at the end of February and 30.2 at the end of January.

Reclaim showed a larger percentage of loss, too, than crude. Consumption of reclaim was 7,420 tons in March, against 8,332 in February, or a drop of 10.9%; whereas consumption of crude rubber in March was 27,828 tons, against 30,012 in February, a drop of only 7.4%.

Manufacturers are doing a very limited business. A few of them, of course, through extra efforts, are making out fairly well, but on the whole activity is slow and manufacturers are marking time.

The action of the automobile industry has been a disappointment to all those in the rubber industry—both reclaim and crude. The advent of the new spring models was hailed with what amounted to a blare of trumpets, but Mr. Consumer is still holding on to his diminishing funds. Ford is expected to put out 1,000 cars a day by May, but so far he has made few deliveries. He has even called many of his demonstration cars back to the factory.

The Rubber Division, in its annual report, showed that the ratio of reclaim consumption to crude has been declining steadily during the last few years. The low price of crude naturally has much to do with this trend. But the report specifically stated that the amount of reclaim used by automobile manufacturers has changed the least, with that in boots and shoes as the one falling most sharply.

As we have said many times, manufacturers are using reclaim now for its inherent advantages, and price is only a secondary consideration. The use of reclaim permits a shorter milling time; power costs are lower; less cure time is required; and less acceleration is required—all advantages that crude does not possess in the same degree and for which manufacturers will pay a premium.

Prices were lower in 4 out of the 13 classes, but only by ¼¢ in each case.

New York Quotations

April 26, 1932

	Spec. Grav.	Cents
High Tensile		
Super-reclaim, black	1.20	5 /5¼
red	1.20	5 /5¼
Auto Tire		
Black	1.21	3¾/4
Black selected tires	1.18	4 /4¼
Dark gray	1.35	5 /5¼
White	1.40	5¼/5¾
Shoe		
Unwashed	1.60	5 /5¼
Washed	1.50	5¾/6
Tube		
No. 1	1.00	6½
No. 2	1.10	4¾/5
Truck Tire		
Truck tire, heavy gravity	1.55	5 /5¼
Truck tire, light gravity	1.40	5¼/5½
Miscellaneous		
Mechanical blends	1.60	3 /3½

Rubber Scrap

THE scrap market showed no change in April from the dull and stagnant tone which prevailed in March. Not only was the hesitancy in general business reflected, but conditions peculiar to the scrap market prevented improvement.

The unseasonable weather had much to do with lower collections in several grades of scrap, and consumption is very low even though prices are at record low levels. In only 2 instances were prices shaded from March, and then only ¼¢, showing that prices probably are at their lowest point.

BOOTS AND SHOES. The warm weather made collections very poor; so this grade of scrap is hard to acquire. The demand for shoes is holding up fairly well. Boots and shoes enjoy as much business as any other grade. Prices were unchanged.

INNER TUBES. Red tubes continue first in sales. Export demand is particularly strong; yet collectors find so little on their rounds that the requirements of buyers remains largely unsatisfied. Floating, compound, and mixed tubes were moderately active. The only price change was in No. 1 floating tubes, which dropped ¼¢.

TIRES. Mixed beadless pneumatics dropped to $11.50/$12.25 from $12.00/$12.50; prices otherwise showed no change. Peelings saw more business than did the other grades in this class, but demand as a whole was poor.

MECHANICALS. April was a dull month in the mechanical scrap market. Prices were unchanged, but this condition denoted no firmness in the market, rather a listlessness in which fractional price changes would have made no difference.

HARD RUBBER. Demand was better in hard rubber, and prices held their own. In March, quotations were shaded almost ¾¢ a pound, but the wider activity held the level firm in April.

The outlook in the scrap market is no better than it has been for the last 2 months. Just a quiet trading affair with few price changes is all that dealers expect.

CONSUMERS' BUYING PRICES

Carload Lots

Delivered Eastern Mills

April 26, 1932

	Prices
Boots and Shoes	
Boots and shoes, black..100 lb.	$0.75/$1.00
Colored .....100 lb.	.625 /.75
Untrimmed arctics.....100 lb.	.50
Inner Tubes	
No. 1, floating .....lb.	.03 /.03¼
No. 2, compound .....lb.	.01½/.01⅝
Red .....lb.	.01¾/.01¾
Mixed tubes .....lb.	.01¼/.01.30
Tires	
Pneumatic Standard	
Mixed auto tires with beads .....ton	8.00/ 8.25
Beadless .....ton	11.50/12.25
Auto tire carcass .....ton	12.00/12.50
Black auto peelings ...ton	19.00/19.50
Solid	
Clean mixed truck....ton	24.00/26.00
Light gravity .....ton	29.00/31.00
Mechanicals	
Mixed black scrap .....lb.	.00¾/.00¾
Hose, air brake .....ton	7.50/ 8.00
Garden, rubber covered lb.	.00¾/.00½
Steam and water, soft...lb.	.00¾/.00½
No. 1 red .....lb.	.01⅜/.01¾
No. 2 red .....lb.	.01 /.01⅛
White druggists' sundries..lb.	.01¼/.01½
Mechanical .....lb.	.00¾/.00⅞
Hard Rubber	
No. 1 hard rubber .....lb.	.07½/.07¾

CHARLES T. WILSON CO., Inc.

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Akron Office: **507 Second National Bldg.**
Telephone: Franklin 4185-4186
Boston Representative: **ERNEST JACOBY, 79 Milk St.**
Telephone: Liberty 8371
Los Angeles Representative: **W. K. THOMPSON, 228 West Fourth St.**
Telephone: Michigan 9797

DIRECT IMPORTERS
of

CRUDE RUBBER

LIQUID LATEX
NORMAL AND CONCENTRATED

Manufacturers' inquiries solicited and will receive prompt attention

Tire Production Statistics

	Pneumatic Casings—All Types			Solid and Cushion Tires		
	In-ventory	Produc-tion	Total Shipments	In-ventory	Produc-tion	Total Shipments
1929	9,470,368	54,980,672	55,515,884	122,200	407,347	436,027
1930	7,202,750	40,772,378	42,913,108	75,871	204,340	250,635
1931	6,219,776	38,992,220	40,048,552	38,815	136,261	167,555
1932						
Jan.	6,329,417	2,769,988	2,602,469	37,327	8,522	9,488
Feb.	7,337,796	3,096,976	2,042,289	37,242	9,754	9,541

	Inner Tubes—All Types			Cotton and Rubber Consumption Casings, Tubes, Solid and Cushion Tires		Consumption of Motor Gasoline (100%) Gallons
	In-ventory	Produc-tion	Total Shipments	Cotton Fabric Pounds	Crude Rubber Pounds	
1929	10,245,365	55,062,886	56,473,303	208,824,653	598,994,708	14,748,552,000
1930	7,099,477	41,936,029	43,952,139	158,812,462	476,755,707	16,200,894,000
1931	6,337,570	38,666,376	40,017,175	151,143,715	456,615,428	16,941,750,000
1932						
Jan.	6,175,055	2,718,508	2,803,369	12,156,282	36,850,171	1,112,370,000
Feb.	7,007,567	3,056,988	2,182,405	12,518,243	39,472,356	1,071,840,000

Rubber Manufacturers Association, Inc., figures representing 80% of the industry since January, 1929, with the exception of gasoline consumption.

Rims Approved by The Tire & Rim Association, Inc.

Rim Size	Three Months, 1931 Number	Three Months, 1931 Per Cent	Three Months, 1932 Number	Three Months, 1932 Per Cent
Motorcycle				
24x3			253	0.0
Clincher				
30x3½	8,287	0.2	4,678	0.2
Drop Center				
16x3.62			20	0.0
17x3.25	1,248		87,773	4.0
17x3.62			268,320	12.3
17x4.00			6,041	0.3
17x4.19			52,786	2.4
18x2.15	12,329	0.3	4,196	0.2
18x3.00			690,909	31.6
18x3.25	194,997	4.9	487,559	22.3
18x3.62			59,500	2.7
18x4.00			54,829	2.5
18x4.19			31,481	1.4
19x2.15	1,331		5,416	0.2
19x2.75	1,505			
19x3.00	2,032,015	51.4	29,883	1.5
19x3.25	19,934	0.5		
19x4.00	18,677	0.5		
20x2.75	423		123	
Semi Drop Base Split Rims				
17x3.00	28			
17x3.25	13,861	0.3		
17x3.62			9,981	0.5
18x3.00	25			
18x3.25	19,558	0.5		
19x3.00	71,522	1.8	10,468	0.5
Flat Base Balloon				
17x3.25	17,677	0.5		
17x4	31,852	0.8	8,246	0.4
17x4½	59,959	1.5	8,636	0.4
17x5	4,677	0.1	844	
18x3.00	316			
18x3.25	85,133	2.2		
18x4	117,722	3.0	3,444	0.1
18x4½	10,729	0.3	91	
18x5	25,464	0.6	1,447	0.1
18x6	13,021	0.3		
19x2.75	48,262	1.2		
19x3.00	38,028	1.0		
19x3.25	2,000	0.1		
19x3½	1,612	0.0		
19x4	176,163	4.5	6,201	0.3
19x4½	108,916	2.7	3,069	0.1
19x5	20,109	0.5	1,753	0.1
Flat Base Balloon (*Continued*)				
20x2.75	9,435	0.2	6,071	0.3
20x3½	6,233	0.2	5,050	0.2
20x4	5,055	0.1	1,730	0.1
20x4½	4,763	0.1	609	0.0
20x5	2,267	0.1	6,753	0.3
21x2.75			488	0.0
21x3½	13,016	0.3	5,462	0.3
21x4	3,896	0.1	1,969	0.1
21x4½	3,971	0.1	1,205	0.1
21x5	1,315	0.0		
21x6	627	0.0	500	0.0
High Pressure				
30x3½	2,248	0.1		
32x4	1,003	0.0	558	0.0
32x4½	650	0.0		
34x4½			258	0.0
18" Truck				
18x5	424	0.0	621	0.0
18x7	2,159	0.1	2,704	0.1
18x8	901	0.0	126	0.0
20" Truck				
20x5	590,355	14.9	223,413	10.2
20x6	58,958	1.5	42,737	1.9
20x7	36,001	0.9	15,332	0.7
20x8	20,740	0.5	14,583	0.7
20x9/10	4,099	0.1	1,063	0.0
20x10.50	758	0.0	92	0.0
20x11	352	0.0	199	0.0
22" Truck				
22x7	802	0.0	349	0.0
22x8	1,174	0.0	1,077	0.0
22x9/10	559	0.0	2,091	0.1
24" Truck				
24x5	1,025	0.0		
24x6	1,021	0.0	535	0.0
24x7	5,029	0.1	2,970	0.1
24x8	10,916	0.3	5,962	0.3
24x9/10	2,760	0.0	2,247	0.1
24x11	50	0.0	233	0.0
Airplane				
18x3	200	0.0		
24x4	109	0.0		
44x10	114	0.0		
Totals	3,950,365		2,184,934	

Statement of "India Rubber World"

Statement of the ownership, management, circulation, etc., required by the Act of Congress of August 24, 1912, of India Rubber World, published monthly at New York, N. Y., for April 1, 1932.

State of New York }
County of New York } ss.

Before me, a Notary Public in and for the State and county aforesaid, personally appeared William M. Morse, who, having been duly sworn according to law, deposes and says that he is the Editor of India Rubber World, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are: publisher, Federated Business Publications, Inc., 420 Lexington Avenue, New York, N. Y.; editor, William M. Morse, 420 Lexington Avenue, New York, N. Y.; managing editor, William M. Morse, 420 Lexington Avenue, New York, N. Y.; business managers, none.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.) Federated Business Publications, Inc., Edward Lyman Bill, Inc., Bill, Brown & Bill Pub. Corp., Caroline L. Bill, Raymond Bill, Edward L. Bill, Randolph Brown, and J. B. Spillane, all located at 420 Lexington Avenue, New York, N. Y.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

William M. Morse, Editor.

Sworn to and subscribed before me this 17th day of March, 1932.

[SEAL] Wm. A. Low.

Notary Public, N. Y. Co. No. 753. Reg. No. 3L487. Certificate filed in Queens Co. No. 1126. (My commission expires March 30, 1933.)

Plantation Rubber Crop Returns by Months

Summary of 615 Producing Companies

1932	Br. N. Borneo (26 Companies) Long Tons	Br. N. Borneo Index	Ceylon (102 Companies) Long Tons	Ceylon Index	India and Burma (21 Companies) Long Tons	India and Burma Index	Malaya (338 Companies) Long Tons	Malaya Index	Netherlands East Indies—Java (60 Companies) Long Tons	Java Index	Netherlands East Indies—Sumatra (60 Companies) Long Tons	Sumatra Index	Miscellaneous (8 Companies) Long Tons	Miscellaneous Index	Total (615 Companies) Long Tons	Total Index
January	353	72.2	1,304	63.9	214	38.1	14,379	115.6	2,797	106.5	4,712	116.9	212	117.1	23,971	107.2
February	333	68.1	758	37.1	82	14.6	11,841	95.2	2,795	106.4	3,894	96.6	120	66.3	19,823	88.6
March	354	72.4	1,106	54.2	191	34.0	11,477	92.3	3,124	119.0	4,274	106.0	173	95.6	20,699	92.6
Three months ending March, 1932	1,040	....	3,168	....	487	....	37,697	....	8,716	....	12,880	....	505	....	64,493	....
1931	1,216	....	3,979	....	1,067	....	36,007	....	8,825	....	12,218	....	537	....	63,849	....

Note. Index figures throughout are based on the monthly average for 1929=100. Issued April 11, 1932, by the Commercial Research Department, The Rubber Growers' Association, Inc., London, England.

CLASSIFIED ADVERTISEMENTS

SITUATIONS WANTED

YOUNG MAN, TWENTY-SEVEN, ASSISTANT SUPERINTENDENT or junior executive, six years' experience production, factory development and research with large corporations, tires, tubes, sundries, packings, brake linings. Knowledge compounding. Moderate salary. Fine record and references. Address Box No. 12,035, care of INDIA RUBBER WORLD.

CHEMIST, AGE FORTY-TWO, SINGLE, 14 YEARS' EXPERIENCE, laboratory and factory work on tires, insulation, and reclaiming. Wide variety of non-rubber chemical experience. Address Box No. 12,036, care of INDIA RUBBER WORLD.

FACTORY MANAGER AND DEVELOPMENT MAN, EXPERIENCED in both soft and hard rubber mechanicals, calenders, mills, and presses. Knowledge of compounding. Reputed excellent handler of men. Address Box No. 12,040, care of INDIA RUBBER WORLD.

SUPERINTENDENT AND CHEMIST, NOW EMPLOYED, DESIRES change. Would like permanent connection with small company interested in expanding. To such company I can bring contacts for large volume of business and would be willing to invest substantial portion of my salary. Years of experience in the following: sponge rubber, extruded products, sport soles, and shoe findings, tiling, plumbers' supplies, matting, druggists' sundries, steam and oilproof packing and specialties. Address Box No. 12,042, care of INDIA RUBBER WORLD.

EXPERIENCED EXECUTIVE AVAILABLE. THOROUGH KNOWLedge and experience covering compounding, manufacturing, development of products, costs, etc. Experience includes soft and hard rubber, mechanicals, gloves, battery cases, automotive parts, etc. Address Box No. 12,043, care of INDIA RUBBER WORLD.

MAN WITH MANY YEARS' EXPERIENCE IN DEVELOPMENT and production; capable; versatile; rubber chemistry and technology at Akron University; can manufacture oil- and acid-proof rubber substitute; age thirty-three; single. Mason. Address Box No. 12,045, care of INDIA RUBBER WORLD.

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FACTORY SUPERINTENDENT, AGE 41, WITH 22 YEARS OF experience in proofing, calendering, auto cloth, hospital sheetings, heels, cements, etc. Would like to become connected with A-1 concern. Has up-to-date formulæ and can handle the works from start to finish. Address Box No. 12,048, care of INDIA RUBBER WORLD.

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We Solicit Your Inquiries
THE BARR RUBBER PRODUCTS COMPANY
SANDUSKY, OHIO

SITUATIONS WANTED—Continued

AVAILABLE IMMEDIATELY: THOROUGHLY TRAINED RUBBER man, age 30 years, married, 6 years' experience in mechanical rubber compounding and development, molded goods, and tubing a specialty. Will go anywhere. Address Box No. 12,050, care of INDIA RUBBER WORLD.

CHEMIST, AGE THIRTY-SIX, MARRIED, UNIVERSITY graduate, desires permanent position. Good technical training, 11 years' experience in alkalis, acids, heavy chemicals, organic accelerators and analyses, rubber and rubber reclaiming manufacture. Available immediately. Moderate salary. Address Box No. 12,051, care of INDIA RUBBER WORLD.

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BUSINESS OPPORTUNITIES

SALESMAN CALLING ON HARDWARE AND DEPARTMENT stores, wishes to represent rubber specialty company on commission basis. Address Box No. 12,038, care of INDIA RUBBER WORLD.

AGENT WISHES TO ACT FOR UNITED STATES OR CANADIAN rubber manufacturers. Willing to undertake marketing and distribution of all classes of articles such as hot water bottles, bathing caps, balloons, rubber bands, druggists' sundries, etc. Sound connection and knowledge of markets. Reply with particulars. Address Box No. 12,039, care of INDIA RUBBER WORLD.

ENGLISH MAKER OF RUBBER AND HYDRAULIC MACHINERY, with well-equipped works, desires to manufacture on royalty basis special rubber and plastic machines for the English market. Address Box No. 12,046, care of INDIA RUBBER WORLD.

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CALENDER: 60-INCH VAUGHN, COMPLETE WITH ALL ELECtrical equipment and used only 6 weeks. At present in Canada but can enter U. S. duty free. Complete details on request. Address Box No. 12,037, care of INDIA RUBBER WORLD.

FOR SALE: EXCEPTIONAL OPPORTUNITY, 3 NO. 2 ROYLE perfected tubers, belt drive; 2 No. 2 Royle perfected tubers, motor drive with motors; 1 experimental mill, 6 by 12, motor drive, single base, with motor; 1 W & P jacketed size 15, type 6, class BB mixer, belt drive. Address Box No. 12,052, care of INDIA RUBBER WORLD.

MACHINERY AND SUPPLIES WANTED

WANTED: USED SCOTT RUBBER AND FABRIC TESTER WITH graphic record attachment; also set of rubber dies and block. Address Box No. 12,044, care of INDIA RUBBER WORLD.

WANTED TO BUY GOOD USED SCOTT TESTING MACHINE. Must be guaranteed accurate. Address Box No. 12,049, care of INDIA RUBBER WORLD.

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A trade journal for the Rubber, Gutta-Percha, Asbestos, and Celluloid Industries and Their Allied Trades.
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(*Advertisements continued on page* 101)

United States Statistics

Imports of Crude and Manufactured Rubber

	January, 1931		January, 1932	
UNMANUFACTURED—*Free*	Pounds	Value	Pounds	Value
Crude rubber	81,328,758	$7,190,591	74,414,859	$3,387,505
Liquid latex	651,859	70,708	742,235	40,613
Jelutong or pontianak	794,307	58,897	1,418,724	81,396
Balata	103,321	31,870	121,650	14,095
Gutta percha	123,330	13,343	33,535	6,062
Siak, scrap, and reclaimed	887,626	6,494	448,473	5,856
Totals	83,889,201	$7,371,903	77,179,476	$3,535,527
Chicle, crude *Free*	661,445	$319,752	214,320	$96,923
MANUFACTURED—*Dutiable*				
Tires *number*	499	$3,554	940	$5,150
Other rubber manufactures	.....	69,256	.....	48,611
Totals	.....	$72,810	.....	$53,761

Exports of Foreign Merchandise

RUBBER AND MANUFACTURES				
Crude rubber	3,865,665	$353,896	3,570,828	$185,466
Balata	22,859	2,598	6,048	1,062
Guayule	24,700	3,575	.....	.....
Gutta percha, rubber substitutes, and scrap	1,509	255	50	45
Rubber manufactures	.....	225	.....	92
Totals	.....	$360,549	.....	$186,665

Exports of Domestic Merchandise

RUBBER AND MANUFACTURES				
Reclaimed	1,454,217	$73,191	1,065,109	$45,649
Scrap and old	4,676,959	111,262	4,161,924	71,790
Rubberized automobile cloth *sq. yd.*	58,251	27,541	50,449	18,041
Other rubberized piece goods and hospital sheeting, *sq. yd.*	85,447	37,564	54,120	17,581
Footwear				
Boots *pairs*	47,584	106,570	27,676	59,021
Shoes *pairs*	71,925	62,129	15,747	11,285
Canvas shoes with rubber soles *pairs*	112,679	85,591	19,040	11,659
Soles *doz. pairs*	4,887	16,103	3,000	6,116
Heels *doz. pairs*	94,522	63,823	33,239	21,329
Water bottles and fountain syringes *number*	15,993	7,413	13,233	4,685
Gloves *doz. pairs*	5,608	15,386	4,882	10,947
Other druggists' sundries	.....	20,627	.....	27,654
Balloons *gross*	53,332	49,716	29,303	23,013
Toys and balls	.....	6,594	.....	1,826
Bathing caps *doz.*	6,400	13,505	1,050	2,056
Bands	37,065	14,812	28,524	9,008
Erasers	26,758	16,475	17,033	10,649
Hard rubber goods				
Electrical goods	135,167	13,256	112,890	11,903
Other goods	.....	16,683	.....	7,242
Tires				
Truck and bus casings, *number*	30,708	695,201	16,493	256,627
Other automobile casings, *number*	130,540	1,026,257	50,971	389,658
Tubes, auto *number*	103,133	146,465	53,039	60,786
Other casings and tubes, *number*	4,145	7,168	1,402	3,881
Solid tires for automobiles and motor trucks *number*	1,079	43,212	631	16,367
Other solid tires	94,870	15,054	183,411	21,516
Tires sundries and repair materials	.....	71,434	.....	36,884
Rubber and friction tape	116,782	31,763	81,360	18,155
Belting	267,859	130,637	149,448	60,112
Hose	428,005	133,343	260,189	67,197
Packing	112,792	44,429	79,843	32,647
Thread	104,935	104,257	100,299	60,753
Other rubber manufactures	.....	137,090	.....	80,431
Totals	.....	$3,344,551	.....	$1,477,068

Imports by Customs Districts

Crude rubber including latex dry rubber content

	February, 1932		February, 1931	
	Pounds	Value	Pounds	Value
Massachusetts	2,199,856	$99,564	2,945,882	$272,485
New York	53,695,460	2,365,792	64,464,686	5,608,318
Philadelphia	.....	.....	134,400	12,146
Maryland	2,021,944	68,846	697,449	56,598
Georgia	1,641,300	54,276	.....	.....
Mobile	1,153,600	42,859	.....	.....
New Orleans	303,317	8,660	.....	.....
South Carolina	.....	.....	896,000	62,687
Los Angeles	2,534,383	98,562	7,455,837	605,860
San Francisco	22,400	1,230	347,263	31,752
Oregon	11,200	600	.....	.....
Michigan	400	35	.....	.....
Ohio	27,682	2,008	.....	.....
Colorado	.....	.....	56,000	4,693
Totals	63,611,542	$2,742,432	76,997,517	$6,654,539

Dominion of Canada Statistics

Imports of Crude and Manufactured Rubber

	December, 1931		Twelve Months Ended December, 1931	
UNMANUFACTURED	Pounds	Value	Pounds	Value
Rubber, gutta percha, etc	5,493,375	$388,135	56,582,678	$4,130,262
Rubber, recovered	660,100	31,313	9,597,000	453,263
Rubber and gutta percha scrap	131,800	4,545	2,556,400	61,065
Balata	200	467	28,428	12,813
Rubber substitute	8,300	956	366,600	42,676
Totals	6,293,775	$425,416	69,131,106	$4,700,079
PARTLY MANUFACTURED				
Hard rubber sheets and rods	383	$270	20,490	$12,403
Hard rubber tubes	.....	301	.....	6,032
Rubber thread not covered	26,391	20,058	300,840	250,249
Totals	26,774	$20,629	321,330	$268,684
MANUFACTURED				
Belting	.....	$3,710	.....	$85,750
Hose	.....	3,156	.....	77,939
Packing	.....	3,588	.....	55,450
Boots and shoes *pairs*	134	217	45,591	23,575
Clothing, including waterproofed	.....	3,268	.....	71,187
Raincoats *number*	405	1,399	32,661	91,773
Gaskets	.....	.....	.....	.....
Gloves	.....	971	.....	18,607
Hot water bottles	.....	2,136	.....	27,665
Tires, bicycle *number*	2,003	684	53,294	24,898
Pneumatic *number*	310	5,258	50,325	307,014
Inner tubes *number*	26	107	15,754	15,693
Solid for automobiles and motor trucks *number*	44	2,196	683	22,228
Other solid tires	.....	701	.....	35,447
Mats and matting	.....	1,491	.....	38,489
Cement	.....	1,909	.....	68,245
Golf balls *dozen*	190	638	45,792	134,373
Heels *pairs*	9,599	677	694,545	22,677
Other rubber manufactures	.....	72,092	.....	1,104,249
Totals	.....	$104,198	.....	$2,225,259
Totals, rubber imports	.....	$550,243	.....	$7,194,022

Exports of Domestic and Foreign Rubber Goods

	Produce of Canada Value	Reexports of Foreign Goods Value	Produce of Canada Value	Reexports of Foreign Goods Value
UNMANUFACTURED				
Waste rubber	$2,146	.....	$48,349	.....
MANUFACTURED				
Belting	$13,272	.....	$269,031	.....
Canvas shoes with rubber soles	67,094	.....	2,192,767	.....
Boots and shoes	78,379	.....	2,215,346	.....
Clothing, including waterproofed	1,807	.....	43,518	.....
Hose	4,024	.....	124,556	.....
Tires, bicycle	28	.....	6,312	.....
Pneumatic	210,431	.....	5,870,121	.....
Inner tubes	19,288	.....	592,658	.....
Solid	1,034	.....	9,261	.....
Other rubber manufactures	245,760	$18,377	2,090,249	$45,783
Totals	$641,117	$18,377	$13,413,819	$45,783
Totals, rubber exports	$643,263	$18,377	$13,462,168	$45,783

Low and High New York Spot Prices

	April		
PLANTATIONS	1932*	1931	1930
Thin latex crepe	$0.03½/$0.04¼	$0.06 /$0.07⅛	$0.14⅜/$0.15⅞
Smoked sheet, ribbed	.02½/ .03⅛	.05⅞/ .06⅞	.14⅜/ .15½
PARAS			
Upriver fine	.05 / .05¼	.08¼/ .09	.15¾/ .16¼
Upriver coarse	†	.06 / .08	.07¾/ ....
Upper caucho ball	†.03 /	.06 / .08	.07½/ ....

* Figured to April 26, 1932.
† Nominal.

London Stocks, February, 1932

			Stocks, February 29		
LONDON	Landed Tons	Delivered Tons	1932 Tons	1931 Tons	1930 Tons
Plantation	5,423	6,650	65,902	82,168	64,452
Other grades	42	39	40	50	41
LIVERPOOL					
Plantation	*3,194	*1,288	*60,016	*44,656	*20,605
Total tons, London and Liverpool	8,659	7,977	125,958	126,874	85,098

*Official returns from the recognized public warehouses.

Classified Advertisements

CONTINUED

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World Rubber Absorption—Net Imports

Long Tons

	Calendar Years		1932		
Consumption	1930	1931	Jan.	Feb.	Mar.
United States	376,107	352,047	28,053	30,110	27,919
United Kingdom	74,760	76,583	5,065	5,226	....
Net Imports					
Australia	5,354	7,649	622	....	....
Austria	2,365	2,970	60	....	....
Belgium	10,740	11,009	....	....	....
Canada	28,793	25,261	1,746	1,723	....
Czechoslovakia	4,532	7,717	197	306	....
Denmark	1,147	971	58	42	....
Finland	1,262	781	12	36	....
France	68,503	46,466	2,588	2,898	....
Germany	45,488	39,688	3,303	4,256	....
Italy	18,570	10,149	627	1,189	....
Japan	32,731	43,483	5,782	....	....
Netherlands	2,924	2,220	479	500	....
Norway	1,143	820	371	50	....
Russia	16,229	30,671	3,258	....	....
Spain	2,400	2,605	462	313	359
Sweden	4,414	3,788	399	580	....
Switzerland	808	848	66	50	....
Others	7,200	*9,600	*800	*800	*800
Totals	705,470	675,326	....	....	....
Minus United States (Cons.)	376,107	352,047	28,053	30,110	27,919
Total foreign	329,363	323,279	....	....	....

* Estimate to complete table.

Compiled by Rubber Division, Department of Commerce, Washington, D. C.

World Rubber Shipments—Net Exports

Long Tons

	Calendar Years		1931	1932		
	1930	1931	Dec.	Jan.	Feb.	Mar.
British Malaya						
Gross exports	547,043	519,740	35,741	44,538	42,008	39,903
Imports	133,876	125,506	11,314	10,304	8,008	6,658
Net	413,167	394,234	24,427	34,234	34,000	33,245
Ceylon	76,406	61,766	6,346	4,893	4,533	*3,405
India and Burma	10,782	8,470	572	732	803	....
Sarawak	10,310	10,451	1,115	756	696	....
British No. Borneo	7,052	6,097	*500	*500	*500	*500
Siam	4,349	4,218	287	457	334	217
Java and Madura	69,755	75,952	5,942	5,155	4,814	....
Sumatra E. Coast	79,396	87,747	8,562	8,815	6,011	....
Other N. E. Indies	115,254	116,009	9,059	8,703	6,325	....
French Indo-China	9,877	11,713	1,567	*1,250	*1,096	*928
Amazon Valley	14,260	12,121	836	831	352	715
Other America	516	222	....	....	....	....
Guayule	1,095	....	....	....	....	....
Africa	3,961	3,072	203	*200	*200	*200
Totals	816,180	792,072	59,416	66,526	59,664	....

* Estimate.

Compiled by Rubber Division, Department of Commerce, Washington, D. C.

Rubber Goods Production Statistics

	1932	1931										
Tires and Tubes	Feb.	Jan.	Dec.	Nov.	Oct.	Sept.	Aug.	July	June	May	Apr.	Mar.	Feb.
Pneumatic casings													
Production ....thousands	....	2,770	2,115	2,001	2,379	2,538	3,125	3,941	4,538	4,543	3,955	3,730	3,188
Shipments ....thousands	....	2,545	2,171	2,223	2,185	3,034	3,845	4,244	4,320	4,197	3,804	3,143	2,580
Domestic ....thousands	....	58	54	87	96	111	123	125	137	135	142	155	142
Exports ....thousands	....	6,329	6,220	6,335	6,640	6,527	7,117	7,936	8,358	8,250	8,025	8,012	7,629
Stocks, end of month ....thousands	....												
Solid and cushion tires													
Production ....thousands	..	9	10	9	11	10	12	13	12	11	12	11	11
Shipments ....thousands	....	9	10	10	13	12	15	15	14	14	14	15	12
Domestic ....thousands	....	0	1	1	1	1	1	1	1	1	1	1	1
Exports ....thousands	....	37	39	42	43	46	51	56	57	61	64	69	73
Stocks, end of month ....thousands	....												
Inner tubes													
Production ....thousands	....	2,719	2,078	1,955	2,462	2,759	3,548	3,964	4,286	4,330	3,693	3,560	3,133
Shipments ....thousands	..	2,761	2,172	2,022	2,187	3,247	4,158	4,569	4,228	4,135	3,610	2,922	2,619
Domestic ....thousands	....	43	41	54	63	73	82	96	89	89	89	109	101
Exports ....thousands	....	6,175	6,338	6,496	6,657	6,476	7,019	7,672	8,403	8,439	8,330	8,380	7,937
Stocks, end of month ....thousands	....												
Raw material consumed													
Fabrics ....thous. of lbs.	....	12,156	7,981	8,361	9,263	9,585	11,745	15,140	17,085	18,010	15,244	14,041	12,002
Crude rubber ....thous. of lbs.	....	36,850	25,237	25,922	28,372	29,854	36,232	46,697	51,280	53,418	45,016	41,851	36,651
Miscellaneous Rubber Products													
Calendered rubber clothing													
Net orders ....no. coats and sundries	....	....	13,654	14,341	20,925	23,966	21,580	17,932	21,161	19,380	16,846	19,380	16,361
Production ....no. coats and sundries	....	....	16,221	23,255	19,773	22,728	27,080	14,431	15,419	18,094	16,803	19,220	18,276
Mechanical rubber goods, shipments													
Belting ....thous. of dollars	....	....	474	483	601	788	802	914	798	790	832	889	722
Hose ....thous. of dollars	....	....	919	856	972	1,041	1,161	1,436	1,650	1,857	2,129	1,892	1,611
All other ....thous. of dollars	....	....	989	961	1,105	1,186	1,393	1,356	1,431	1,584	1,656	1,631	1,378
Total ....thous. of dollars	....	....	2,381	2,300	2,678	3,015	3,356	3,706	3,879	4,231	4,617	4,412	3,711
Rubber bands, shipments ....thous. of lbs.	....	206	231	197	225	201	195	246	209	215	259	231	222
Rubber flooring, shipments ....thous. of sq. ft.	....	..	587	462	550	595	595	577	576	569	569	496	366
Rubber and canvas footwear													
Tennis													
Production ....thous. of pairs	..	2,496	2,077	1,443	1,231	1,012	1,021	836	1,999	2,142	2,591	2,609	2,492
Shipments, domestic ....thous. of pairs	....	2,353	616	446	589	1,263	1,223	1,520	2,657	3,316	4,049	3,107	2,688
Exports ....thous. of pairs	....	21	118	29	44	72	29	125	100	121	150	236	200
Stocks ....thous. of pairs	....	8,510	8,387	7,044	6,076	5,473	5,704	5,957	6,766	7,523	8,833	10,328	11,047
Waterproof, total													
Production ....thous. of pairs	....	1,061	2,391	2,773	3,131	2,922	2,361	1,570	1,922	1,261	1,102	874	958
Shipments, domestic ....thous. of pairs	....	1,610	3,438	3,186	4,318	4,185	2,842	1,510	1,229	626	1,070	944	1,015
Exports ....thous. of pairs	....	6	36	59	153	186	151	117	108	50	72	53	92
Stocks ....thous. of pairs	....	11,726	12,241	13,323	13,804	15,141	16,366	16,978	17,024	16,357	15,733	15,803	16,030
Grand total													
Production ....thous. of pairs	....	3,557	4,468	4,217	4,363	3,934	3,382	2,407	3,921	3,402	3,693	3,483	3,450
Shipments, domestic ....thous. of pairs	....	3,962	4,054	3,632	4,907	5,448	4,065	3,030	3,886	3,942	5,119	4,050	3,704
Exports ....thous. of pairs	....	27	154	88	197	258	180	242	208	171	222	288	292
Stocks ....thous. of pairs	....	20,237	20,628	20,367	19,880	20,615	22,070	22,935	23,789	23,881	24,566	26,130	27,077
Rubber heels													
Production ....thous. of pairs	14,487	12,317	14,138	11,455	14,567	15,827	16,293	15,361	17,093	15,474	15,408	14,661	13,156
Shipments													
Exports ....thous. of pairs	259	290	474	591	617	501	514	540	630	612	578	577	658
Repair trade ....thous. of pairs	4,575	3,431	4,622	4,537	5,924	6,994	5,355	4,058	4,946	3,975	4,038	4,868	4,854
Shoe manufacturers ....thous. of pairs	8,748	8,705	8,198	6,610	7,484	9,724	11,653	11,177	10,522	9,693	10,112	10,991	8,397
Stocks, end of month ....thous. of pairs	25,807	....	24,405	25,213	24,652	23,952	25,832	27,006	27,898	28,491	27,764	26,708	29,335
Rubber-proofed fabrics, production													
Auto fabrics ....thous. of yds.	....	....	380	394	445	528	596	531	701	982	710	738	644
Raincoat fabrics ....thous. of yds.	....	....	931	1,267	2,476	2,988	2,226	1,843	1,355	1,066	1,040	863	567
All other ....thous. of yds.	....	....	763	868	1,191	1,176	965	963	1,156	1,002	1,271	1,168	973
Total ....thous. of yds.	....	....	2,074	2,529	4,112	4,692	3,787	3,337	3,212	3,050	3,021	2,769	2,184
Rubber soles													
Production ....thous. of pairs	3,461	3,411	3,639	2,840	2,610	2,880	2,933	2,864	3,177	2,885	2,692	2,292	2,724
Shipments													
Exports ....thous. of pairs	3	8	25	29	45	90	67	67	59	62	69	14	36
Repair trade ....thous. of pairs	285	265	267	308	370	290	234	196	225	330	255	408	290
Shoe manufacturers ....thous. of pairs	2,925	2,953	3,196	2,579	2,273	2,604	2,790	2,569	2,899	2,651	2,474	2,145	2,259
Stocks, end of month ....thous. of pairs	2,428	....	2,018	2,180	2,153	2,264	2,395	2,475	2,461	2,655	2,764	2,876	3,167

Source: *Survey of Current Business*, Bureau of Foreign and Domestic Commerce, Washington, D. C.